SITE MANAGEMENT PLAN
AREA IV RADIOLOGICAL STUDY
SANTA SUSANA FIELD LABORATORY SITE
VENTURA COUNTY, CALIFORNIA

U.S. EPA Contract Number: EP-S7-05-05
Task Order Number: 0038

Prepared for:

U.S. Environmental Protection Agency Region 9
75 Hawthorne Street
San Francisco, California 94105

September 24, 2010

HydroGeoLogic, Inc

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TASK ORDER 0038

PROJECT: Area IV Radiological Study
Santa Susana Field Laboratory Site

TASK ORDER NUMBER: 0038

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Task Order Manager: Eric Evans, P.G.
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LIST OF ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive, Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
DMP	Data Management Plan
DQO	Data Quality Objective
ETEC	Energy Technology Engineering Center
FSP	Field Sampling Plan
HGL	HydroGeoLogic, Inc.
HSA	Historical Site Assessment
NAA	North American Aviation
NBZ	Northern Buffer Zone
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SAP	Sampling and Analysis Plan
SMP	Site Management Plan
SSFL	Santa Susana Field Laboratory
SSHP	Site Safety and Health Plan
USEPA	U.S. Environmental Protection Agency

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SITE MANAGEMENT PLAN
SANTA SUSANA FIELD LABORATORY SITE
AREA IV RADIOLOGICAL STUDY
VENTURA COUNTY, CALIFORNIA

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (USEPA) is conducting an extensive radiological characterization study for Area IV and the Northern Buffer Zone (NBZ) within the Santa Susana Field Laboratory (SSFL). The SSFL site is located in Ventura County, California, and is depicted on Figure 1.1. This project addresses SSFL Area IV, which consists of 290 acres, and the NBZ, a 182-acre tract of naturally vegetated land. The Boeing Company owns both Area IV and the NBZ. Collectively, these areas are referred to as the Area IV Radiological Study Area. The boundaries of the Area IV Radiological Study Area are illustrated on Figure 1.2.

This work is being executed under an USEPA Region 7 Architect and Engineering Services Contract EP-S7-05-05, Task Order 0038 being administered and managed by USEPA Region 9. HydroGeoLogic, Inc. (HGL) is USEPA's contractor on this project.

The major activities to be conducted under the Area IV Radiological Study task order are summarized below:

- **Historical Site Assessment (HSA)**. This involves an independent review of documents related to previous radiological operations and past releases of radiological materials at SSFL Area IV. The objective of the HSA phase is to identify the full range of potential radiological contaminants and locations where radiological contaminants may have been released to the environment at SSFL.
- **Gamma Scanning of Area IV Study Area**. A complete scan of accessible areas within the Area IV Study Area will be completed to identify locations of elevated gamma radiation in surface soils. At select locations, downhole gamma scanning will be conducted in soil borings to identify subsurface gamma radiation anomalies. The results of the gamma scanning will be used to help select locations and depth intervals for subsequent soil sampling and laboratory analyses.
- **Testing of Groundwater, Surface Water, and Sediment**. This sampling effort is designed to meet one component of the overall project objective: evaluate the presence of radiolonuclide contamination in surface water, sediments, and groundwater associated with Area IV. This will be achieved through the collection and analysis of samples from each media.
- **Geophysical Testing**. The objective of the geophysical investigation is to identify areas of potential subsurface disturbance that may indicate waste burial areas or areas associated with historical radiological releases. The subsurface geophysical survey will be conducted using an electromagnetic conductivity meter, a magnetometer, and a

ground-penetrating radar in locations suggested or determined by the HSA, aerial photo interpretation study, gamma radiation scanning survey, and field observations.

- **Testing of Soil and Subsurface Soil**. Based largely on the data collected from the HSA and the gamma scanning survey, field sampling plans (FSP) will be developed for the sampling and analysis of surface and subsurface soil within the Area IV Study Area. These FSPs will include specific sampling locations, number of samples to be collected, procedures to be followed for sample collection and analysis, required equipment, laboratories to be used for sample analyses, laboratory detection limits, quality assurance and quality control procedures, and data evaluation methods.

1.1 PURPOSE OF THIS SITE MANAGEMENT PLAN

This Site Management Plan (SMP) describes many of the management and technical procedures that will be used to execute USEPA's Area IV Radiological Study, including the field protocols for complying with the substantive requirements of applicable Federal, State and local regulations. The specifics of the gamma scanning and multimedia sampling efforts are detailed in separate planning documents prepared for each of these field efforts.

The SMP is a dynamic document and will be revised as the project progresses to accommodate new information, including changes to the scope of work, schedule changes, and other variables. Field protocols have been prepared as stand-alone documents and provided as appendices. These field protocols will be revised and new protocols developed as necessary over the duration of the project. Revisions will be tracked by revision number and date, and only the most current version of the SMP will be posted to USEPA's website.

1.2 SITE BACKGROUND

The SSFL is located in southeastern Ventura County, California, approximately 2 miles south of Simi Valley and 30 miles northwest of downtown Los Angeles between the Simi and San Fernando valleys in the Simi Hills. The site is divided into four administrative areas (I, II, III, and IV) and undeveloped buffer properties to the northwest and south as described below (Figure 1.1). Most nuclear research related programs and operations ceased in 1988 (Energy Technology Engineering Center [ETEC], 2010). The majority of site buildings have been demolished. USEPA is completing an HSA of the SSFL site detailing the site history. A brief discussion of the site history is provided below.

1.3 SITE HISTORY

Before development, the area comprising the SSFL site was used for ranching. In approximately 1948, North American Aviation, Inc. (NAA) began development of over 1,600 acres of land in the northeast section of the site for the design, development, and testing of liquid propellant rocket engines. Initially supporting the U.S. Air Force, the facilities at the SSFL site supported virtually every major space program, from the earliest satellite launches to the Space Shuttle (NAA, 1960). Area I of the SSFL site contains administrative and laboratory facilities and has been used for rocket engine testing. Area II included additional rocket engine test facilities known as the Alfa, Bravo, Coca, and Delta facilities. This area also included facilities for small jet engine testing. Area III, located in the northwest portion of the SSFL

site, included facilities for small engine testing using propellants that were developed on site (Thielking et. al., 1987). The Rocketdyne Division of NAA operated these portions of the SSFL site until approximately 1996 when Rocketdyne merged into The Boeing Company (NAA, 1960). Since approximately 1996, operations at the site have been conducted by The Boeing Company (ETEC, 2010).

In addition to rocket and small engine testing facilities, NAA also had facilities at Area IV for researching, developing, and constructing equipment for harnessing nuclear energy through its Atomics International Division (NAA, 1960). According to a 1959 company brochure, Atomics International maintained a nuclear field test area covering approximately 300 acres at the SSFL site (Atomics International, 1959). Under contract to the Department of Energy, Atomics International supported the development of civilian nuclear power, as well as the testing of non-nuclear components related to liquid metals within 90 acres of Area IV of the SSFL site. The facilities within these 90 acres would later be referred as the ETEC (ETEC, 2010).

Nuclear operations facilities at ETEC included 10 nuclear research reactors. These 10 nuclear reactors included the Sodium Reactor Experiment, the Space Nuclear Auxiliary Power liquid-metal reactors, and seven critical facilities (i.e., facilities housing operations involving masses of fissionable material capable of sustaining a nuclear chain reaction) (Atomics International, 1959). Other facilities within Area IV included the Radioactive Materials Disposal Facility and the Hot Laboratory, as well as the Sodium Disposal Facility, or Area IV burn pit. Each of these facilities will be addressed as a site within the technical memoranda being prepared by USEPA under the HSA task.

1.4 RADIONUCLIDES OF CONCERN

A list of 77 radionuclides of concern was developed for the Final Sampling and Analysis Plan (SAP), Radiological Background Study to determine background surface and subsurface soil concentrations (HGL, 2009). This list was developed as a preliminary list of radionuclides which may have been used at the SSFL. The Radiological Background Study acknowledged that the list of radionuclides of interest was subject to change based on USEPA's HSA.

1.5 PROJECT SCHEDULE

Throughout the project, USEPA will maintain a detailed project schedule in the Primavera Project Management software. This schedule will be updated on a monthly basis and any delays in the project schedule will be documented. The major milestones for the project are presented in Table 1.1.

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2.0 PROJECT MANAGEMENT AND COMMUNICATION

This section describes the roles, responsibilities, and authority of USEPA and HGL personnel involved in the SSFL Area IV Radiological Study. A Radiological Study Technical Stakeholder Workgroup has been established to assist with project planning and review. The Workgroup includes representatives of USEPA Region 9, HGL, the Department of Energy, The Boeing Company, State of California Department of Toxic Substances Control, and community members.

2.1 ROLES AND RESPONSIBILITIES OF U.S. ENVIRONMENTAL PROTECTION AGENCY AND HYDROGEOLOGIC, INC.

As defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), USEPA Region 9 is the lead agency for this project. As such, USEPA has the ultimate decision making authority in all technical and administrative matters associated with this project. The project is being managed jointly by USEPA Region 9 Project Managers as follows:

- Craig Cooper
- Nicole Moutoux
- Mary Aycock

The USEPA Project Managers are assisted by USEPA technical staff in both USEPA Region 9 and USEPA's Office of Radiation and Indoor Air Laboratory in Las Vegas, Nevada. The two primary Office of Radiation and Indoor Air USEPA technical leads on the project are Gregg Dempsey, Senior Science Advisor, and Roger Shura, USEPA Gamma Scanning Expert.

The USEPA Region 9 Project Managers are HGL's primary contacts for coordinating work and will communicate directly with the HGL Project Manager. As the HGL Project Manager, Mr. Eric Evans is the primary point-of-contact with USEPA on technical and administrative matters associated with this project. Mr. Evans is responsible for the overall management and implementation of the SSFL Area IV Radiological Study project in accordance with Task Order 038. Mr. Evans will be assisted by Deputy Project Manager, Mr. Chuck Smith, Certified Hazardous Materials Manager (CHMM). Mr. Smith has been delegated responsibility for overseeing key project elements, such as subcontractor procurement. The Field Operations Manager, Steve Vaughn, will be responsible for managing the staff that will be located at the SSFL. Mr. Vaughn will also assist the Project Manager in managing the technical elements of the project. The Project Manager, Deputy Project Manager, and Field Operations Manager will be supported by experienced field personnel and key project personnel. Figures 2.1a and 2.1b illustrate the current organizational structure for the project and show the USEPA and HGL staff assigned to this project. Table 2.1 summarizes the roles of key project personnel.

2.2 MANAGEMENT OF WORK PRODUCT QUALITY

Jan Kool, PhD, is HGL's Corporate Quality Assurance (QA)/Quality Control (QC) Officer and oversees quality control for HGL's Engineering and Construction Division. Dr. Kool has

designated authority for QC matters on the SSFL Area IV Radiological Study project to Mary Knowles, and she will report directly to Dr. Kool on matters of QC. Mary Knowles will review project planning documents and deliverables, audit project logbooks as necessary, assure that site work is conducted in accordance with approved planning documents, and report any QC discrepancies to the Project Manager and Corporate QA/QC Officer and will verify that appropriate corrective actions are taken.

2.3 DOCUMENT CONTROL

Planning documents and deliverables developed for the SSFL are considered to be controlled documents. A controlled document is a reference document which, through the course of its lifecycle may be reviewed, modified and distributed several times. Their distribution is traceable to enable changes to be executed. Upon publication, they are distributed to a limited number of individuals and outside information repositories. Each controlled document has a distribution list, showing the number of copies and to whom copies were disseminated.

A Document Control Manager has been assigned to track and control planning documents, technical reports, and other key documents associated with the SSFL project. A library of project documents has been established at the field office. The Document Control Manager will maintain an index of all documents to ensure that only the final approved versions are used by field staff and other project personnel. When any controlled document is revised, updates and revisions are distributed to the individuals and locations specified on the distribution list, and the current version supersedes its previous version.

Documents are kept in a secure location within the field office and must be checked out through the Document Control Manager.

2.4 DATA MANAGEMENT

A Data Management Plan (DMP) has been developed for the SSFL site to manage gamma scanning, analytical, and geospatial data. The DMP is included as Appendix D. The DMP documents the methodology that will be employed during project execution to link the various data management tools, including software packages, to assure that the various data and information types to be collected are systematically collected and managed. The DMP also includes discussion of the following: data management team organization; the project-specific database structure; gamma scanning and analytical data management; and data archiving.

2.5 HEALTH AND SAFETY MANAGEMENT

All field activities will be conducted in accordance with applicable Occupational Safety and Health Administration standards, and best practices for maintaining a safe working environment. Site-specific health and safety plans have been prepared by both HGL and USEPA, which address potential hazards associated with field work at the SSFL site, and the safety measures that will be employed to minimize safety risks.

2.5.1 HydroGeoLogic, Inc. Health and Safety Plan

HGL maintains a Corporate Health and Safety Program, which is outlined in the Corporate Health and Safety Manual. HGL's Corporate Health and Safety Manual is compliant with Occupational Safety and Health Administration. The corporate program is managed by Mark McGowan, a Certified Industrial Hygienist and Certified Safety Professional with over 20 years of experience in the environmental industry. For the SSFL project, a Site Safety and Health Plan (SSHP) has been developed to address specific safety issues and concerns associated with site conditions, known and potential chemical hazards, and biological hazards.

The HGL SSHP was prepared as a standalone document and submitted under separate cover. The SSHP defines and documents the health and safety procedures to be implemented for the project. The SSHP meets the requirements of 29 Code of Federal Regulations (CFR) 1910 and 1926 (Occupational Safety and Health Administration, 2009), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (National Institute of Occupational Safety and Health, 1985), EPA Order 1440.1 Respiratory Protection, and EPA Order 1440.3 Health and Safety Requirements for Employees Engaged in Field Activities (USEPA, 1997).

2.5.2 U.S. Environmental Protection Agency Health and Safety Plan

The USEPA has developed a site-specific Health and Safety Plan pursuant to 29 CFR1910.120 that covers both USEPA employees and visitors who may be on site to oversee USEPA's work. The USEPA's Health and Safety Plan was prepared as a standalone document and submitted under separate cover.

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3.0 COMMUNITY INVOLVEMENT

Community involvement activities in support of USEPA's work at SSFL will be conducted in accordance with USEPA's Community Involvement Plan prepared for the SSFL site. The overall goals of USEPA's Community Involvement Program are to:

- Provide opportunities for the public to become actively involved in the project.
- Meet the community's information needs.
- Incorporate issues and concerns into the assessment.
- Give feedback to the public on how their issues and concerns were incorporated into USEPA's work.

The Community Involvement Plan explains how the USEPA will communicate with the public through several mechanisms: routine meetings, work groups, fact sheets, a newsletter, and other means. The Community Involvement Plan was prepared and disseminated to stakeholders in February 2010.

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4.0 FIELD INVESTIGATION AND DATA ACQUISITION ACTIVITIES

4.1 PREPARATION OF PLANNING DOCUMENTS

Planning documents have been prepared to outline and document how the various field sampling efforts to be conducted under the Area IV Radiological Study will be executed, and present the quality measures to be implemented to assure that data quality objectives (DQO) are met. The following planning documents support the SSFL field effort:

Quality Assurance Project Plans – Two site-specific Quality Assurance Project Plans (QAPP) were prepared for the project: one for the soil sampling effort and one for the groundwater, surface water, and sediment sampling effort. Each QAPP presents the QA/QC procedures to be followed during all characterization activities. Each QAPP specifically addresses the QA/QC requirements for sample collection and handling for off-site analysis, procedures to assure that DQOs are achieved, and field and laboratory QC procedures. The QAPPs were prepared in accordance with USEPA QA/R-5 EPA Requirements for Quality Assurance Project Plans, Final (USEPA, 2001), and companion document EPA/G-5, EPA 600/R-98-018 Guidance for Quality Assurance Project Plans, (USEPA, 2002). The QAPPs discuss the project objectives and organization, functional activities, and QA/QC protocols that will be used to achieve the desired DQOs for each sampling effort. DQOs for sample collection at the site were established based on EPA QA/G-4 Guidance on Systematic Planning Using the Data Quality Objectives Process (USEPA, 2006).

Field Sampling Plans – Two FSPs were prepared for the project: one for the soil sampling effort and one for the groundwater, surface water, and sediment sampling effort. The soil sampling FSP describes the sample collection methods, and type of analyses required for collecting and analyzing surface and subsurface soil samples for the Area IV Radiological Study. The number, type, and locations of surface and subsurface soil samples are specified in individual quadrant-specific FSPs that will be prepared for each of the four sampling subareas of the Area IV Study Area, the sample collection methods, and type of analyses required for the Area IV Radiological Study. A separate FSP was prepared for the groundwater, surface water, and sediment sampling effort. This FSP describes the number, type, and locations of groundwater, surface water, and sediment samples, along with the procedures that will be employed to collect these samples. These FSPs are applied in concert with the procedures and methods specified in the respective QAPPs to guide field activities.

Sampling and Analysis Plan – For the Gamma Scanning Survey, a SAP was prepared. The SAP consists of an FSP and a QAPP that specifically address the scanning procedures, QA/QC measures, and DQOs for the gamma scanning effort.

4.2 RADIOLOGICAL STUDY FIELD ACTIVITIES

4.2.1 Gamma Scanning

Gamma scanning will be conducted using multiple types of equipment to determine the presence of potential radioactive contamination in surface soil and subsurface soil. Surface gamma scanning will be conducted at all accessible areas of the site. Borehole gamma scanning will be conducted in soil borings completed during the investigation. The gamma scanning effort is detailed in the Final Gamma Radiation Sampling and Analysis Plan (HGL, 2010) prepared as a separate planning document. The general activities associated with the gamma scanning effort are summarized in the following subsections.

4.2.1.1 Surface Gamma Scanning

The objective of surface gamma scanning is to identify and characterize elevated areas of gamma radiation in surface soil for 100 percent of the accessible areas of the site. Gamma scanning will be completed using a combination of forklift-mounted, mule-mounted, wheel-mounted, and hand-held mounted scanning systems.

- Forklift-mounted system. Custom-built system capable of detecting low-to-moderate levels of gamma radiation. This scanning system will be used on flat terrain.
- Mule-mounted system. Custom-built system capable of detecting low-to-moderate levels of gamma radiation. This scanning system will be used on terrain that is too steep for the forklift-mounted system.
- Wheel-mounted system. Custom-built system capable of detecting moderate levels of gamma radiation. This scanning system will be used on terrain that is too steep for the mule-mounted system.
- Hand-held system. Pre-constructed gamma scanner capable of detecting high levels of gamma radiation. This scanning system will be used on the roughest terrain that is too steep for all other gamma scanning systems.

4.2.1.2 Borehole Gamma Scanning

The objective of borehole gamma scanning is to identify and characterize elevated areas of gamma radiation in subsurface soil. After the completion of a borehole, a polyvinyl chloride pipe will be placed inside the hole to prevent loss of the borehole gamma detector in the event that the hole collapses. The largest pipe that can fit into the borehole will be used so the largest detector possible can be used to increase detection sensitivity. A borehole gamma detector will then be lowered into the borehole, and gamma radiation levels will be recorded at discrete intervals.

4.2.2 Geophysical Investigation

The objective of the geophysical investigation is to identify areas of potential subsurface disturbance that may be indicative of waste burial areas, dump and spill sites, or waste storage areas. The subsurface geophysical survey will be conducted using ground-penetrating radar,

an electromagnetic conductivity meter, or a magnetometer in locations determined through analysis of the HSA report. The field methods and procedures for the geophysical survey are detailed in the FSP for Soil Sampling prepared as a separate planning document.

4.2.3 Soil Sampling

The objective of surface and subsurface soil sampling is to characterize the nature and location of radiological contamination in surface soil within the Area IV Study Area. The field methods and procedures for the surface and subsurface soil sampling effort are detailed in the FSP for Soil Sampling. Sample locations will be detailed in individual FSPs that will be prepared for each of four sampling subareas denoted Quadrants 1 through 4.

4.2.4 Surface Water, Sediment, and Seep Sampling

Surface water, sediment and seep samples will be collected from select locations on site. The field sampling procedures for this multi-media sampling effort are detailed in the FSP for Groundwater, Surface Water, and Sediment Sampling prepared as a separate planning document. Once sample locations are selected they will be presented in an addendum to the FSP.

If data obtained from the on-site samples indicate a need for testing in off-site areas, USEPA will work closely with Department of Toxic Substance Control to include collection of data in those areas. USEPA communicated their approach for sampling in off-site areas with Ms. Linda Parks, Ventura County Supervisor, 2nd District, who represents the District that is adjacent to the SSFL. Copies of USEPA's correspondence with Ms. Parks are provided in Appendix A.

4.3 RADIOLOGICAL STUDY DATA REPORTS

Numerous data reports will be submitted in support of the Area IV Radiological Study conveying the findings of the various research and investigative phases of the project.

4.4 MANAGEMENT OF SITE FACILITIES

4.4.1 Site Access and Security

General site security and access control at the SSFL site is performed by The Boeing Company. The Administration Order on Consent for Access and Participation/Cooperation with EPA Response Actions (USEPA, 2010) established between USEPA and The Boeing Company on March 12, 2010, provides USEPA with the necessary access to complete the Area IV Radiological Study. This agreement details security requirements, schedule limitations (days and times), work planning and coordination provisions, health and safety specifications, environmental and cultural restrictions, property entrance and egress stipulations, access of the general public, and access to groundwater monitor wells.

On-site workers, contractors, and visitors are required to have Boeing-issued badges before entering Boeing property. There are three types of access privileges: Boeing employees, Boeing non-employees, and temporary visitors. Each type of access requires badges that are

approved and issued by The Boeing Company. The access agreement allows USEPA and contractor personnel from HGL and The Palladino Company rights to enter and exit the SSFL site between 6:00 a.m. to 5:30 p.m., Monday through Friday without making an appointment or having a Boeing escort, provided they have a non-employee Boeing badge. USEPA subcontractors without Boeing badges will be escorted by USEPA, HGL, or The Palladino Company staff with an USEPA escort privileges label on their badge. USEPA may request to work outside the 6:00 a.m. to 5:30 p.m. timeframe to make optimal use of field resources. If so, this will be coordinated through The Boeing Company.

Close coordination with property owners will be required to ensure that field work is conducted in accordance with acceptable work schedules and in compliance with access and security requirements. The Boeing Company will assist and support USEPA's work-related requests. To solve issues that the access agreement did not anticipate and to coordinate on day-to-day field issues, the USEPA will hold weekly and monthly Work Coordination Meetings with The Boeing Company. Mary Aycock is USEPA's on-site representative and is the primary USEPA point-of-contact for agenda items, participation, and meeting summaries for both the weekly and monthly meetings.

4.4.2 On-site Project Office

The property that will be used for the on-site project office is located at the northeast corner of F Street and Court II Road within Area II (Figure 4.1). USEPA negotiated agreements in the form of a transfer letter and memorandum of understanding with General Services Administration for this property (Appendix B).

The property contains six structures. The project team will utilize four of the six buildings. The four buildings include Building 204 and three unnumbered buildings that will be used as ancillary support facilities. The unnumbered buildings are located north, south and east of Building 204. The use of each building is listed below and illustrated on Figure 4.1.

- Building 204–general office functions, equipment storage and equipment maintenance.
- Building 760 South of Building 204–house air compressor and miscellaneous storage.
- Building East of Building 204–investigation derived waste staging.
- Building North of Building 204–livestock management.

USEPA personnel, HGL employees and HGL subcontractors will occupy Building 204, which will be fitted with work stations providing computer resources, phone, and internet access. The office floor plan is illustrated on Figure 4.2. The office building is temperature controlled and includes utilities, such as sewer, trash service, electricity, and water. Bottled water will be provided to all staff, along with the option of showering for the purpose of personal decontamination after field work. Access to the site property will be controlled with the use of a fenced boundary and gate access on the west and east sides. The location of the proposed fence is illustrated on Figure 4.1.

A radiation survey was conducted at Building 204 on October 28, 2009, with results indicating the area is safe for occupancy. A copy of the report summarizing the survey effort is provided as Appendix C. Although within the on-site field office area, Building 205 and Building 796, will not be entered by USEPA representatives due to existing environmental conditions in those buildings. Building 205 contains asbestos and Building 796 contains paint-related waste.

4.4.2.1 On-site Field Office Maintenance and Management

The on-site field office required some renovation and general maintenance before it could be used to support the project. The major renovations included:

- adding an interior wall;
- cleaning and painting the interior of the office and garage;
- replacing the carpet, ballasts and burned-out light bulbs;
- grinding floor bolts flush to the ground;
- installing shower facilities, a washer and dryer, and new door locks for outside doors and three internal offices;
- inspecting swamp coolers and sealing the exterior of the building;
- refinishing the floors;
- modifying the women's bathroom to add one stall;
- repairing the roof, and remediating asbestos-containing floor tiles.

HGL will be responsible for all required building maintenance throughout the execution of the project. This includes building repairs and cleaning. Cleaning and trash removal services for the office will be completed weekly by a subcontracted janitorial service provider.

4.4.2.2 Equipment Storage and Maintenance

Field equipment and sampling supplies will be housed in the storage area of Building 204. The storage area will have locked cabinets to store equipment along with outside doors that will have replaced locks (i.e., locks that have not been used previously). The HGL Equipment Manager will have the responsibility of maintaining a master equipment list, checking equipment out to field teams, checking equipment in from the field teams, inspecting equipment, verifying equipment calibration, ordering replacement parts or equipment, and documenting equipment conditions and repairs.

4.4.2.3 Sample Packaging and Shipping

Samples will be labelled, packaged, and stored in Building 204. The samples will be stored in a locked area until they are shipped to the laboratory. When sent by common carrier the packaging, labeling, and shipping of hazardous materials is regulated by the U.S. Department of Transportation under CFR 49, Part 172. Samples will be handled, packed, and shipped in accordance with all applicable U.S. Department of Transportation regulations. Specific sample packaging and shipping procedures are provided in the soil sampling FSP and the groundwater, surface water, and sediment FSP.

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5.0 ENVIRONMENTAL COMPLIANCE

Field work for the Area IV Radiological Study will be phased over the period of performance, and will include several investigative techniques: gamma scanning using real-time measurement devices; multi-media sampling of soil, surface water/seeps, and sediment; and geophysics. These activities will be executed in compliance with all applicable state, federal, and local regulations for protection of natural resources, waste management, and emergency and contingency procedures. To ensure compliance with prevailing regulations, USEPA evaluated known applicable and appropriate regulations as listed on Table 5.1.

The results of the coordination efforts will be incorporated into this SMP as appropriate when they have been documented and finalized.

The Area IV Radiological Study is being executed pursuant to the CERCLA with USEPA as the lead agency. USEPA determined in the final rule (1985 National Contingency Plan section 300.68[a][3]) that "Federal, State, and local permits are not required for Fund-financed action or remedial actions taken pursuant to Federal action under section 106 of CERCLA." The 1986 amendments to CERCLA codified section 300.68(a)(3) of the 1985 National Contingency Plan with a statutory provision, section 121(e)(1) (USEPA, 1985). CERCLA section 121(e)(1) provides that no Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on site, where such remedial action is selected and carried out in compliance with section 121 (USEPA, 1992). However, USEPA's proposed action at the SSFL site will be conducted in a manner that protects human health and the environment, and in compliance with the substantive technical aspects of applicable laws. Site operations will be controlled through implementation of the site-specific protocols provided as appendices to this SMP.

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6.0 CONTROL OF ON-SITE OPERATIONS

On-site operations will be controlled through the implementation of specific procedures and protocols to manage protection of natural and cultural resources, manage livestock, manage hazardous waste, and provide contingencies in the event of emergencies. Each operation-specific procedure was developed to fulfill the substantive requirements of the applicable Federal, State, and local regulations as discussed in Section 5.0 and summarized in Table 5.1. Each operation-specific procedure lists the applicable regulations and details the procedures that will be implemented in the field to meet regulatory requirements. These plans are presented as stand-alone documents in the appendices section. As the project progresses, these plans will be updated and reissued as necessary.

6.1 VEGETATION CUTTING PROTOCOL

The Vegetation Cutting Protocol summarizes the protection and mitigation measures that will be taken to ensure protection of listed and candidate species with the study area. This document is provided in Appendix E.

6.2 CULTURAL RESOURCES PROTECTION MEASURES

Field activities associated with USEPA's proposed action at the SSFL site that disturb the ground surface may potentially have an adverse effect on archaeological artifacts. To mitigate the potential for disturbing known cultural resources at the site, cultural resources protection measures have been developed. This document is provided in Appendix F.

6.3 NATURAL RESOURCES PROTECTION MEASURES

The Natural Resources Protection Measures document provided in Appendix G describes the protection measures that will be implemented during the execution of field activities at the SSFL site. An information sheet is provided for each listed species in the Biological Assessment, Santa Susana Field Laboratory, Area IV Radiological Study, Ventura County (Envicom, 2010) prepared for the U.S. Fish and Wildlife Service.

6.4 LIVESTOCK MANAGEMENT PROTOCOLS

Procedures that will be implemented to manage livestock that will be used during the field investigation are detailed in Appendix H.

6.5 HAZARDOUS MATERIALS MANAGEMENT AND SPILL RESPONSE PROCEDURES

The procedures for the hazardous materials management and spill response measures that will be taken to protect worker safety and the environment are detailed in Appendix I.

6.6 INVESTIGATION-DERIVED WASTE MANAGEMENT PROCEDURES

USEPA's plan to manage investigation-derived waste that anticipated to be generated during the proposed action is detailed in Appendix J.

6.7 FIRE PREVENTION PROTOCOLS

Fire prevention will be an important aspect of this project as southern California is known for wild fires, exacerbated by drought conditions and Santa Ana winds. Strict fire prevention protocols will be followed during project execution. These protocols are detailed in Appendix K.

6.8 EMERGENCY AND CONTINGENCY PROCEDURES

Appendix L details the procedures to be followed should an emergency incident occur during the radiological survey. Response procedures are provided for handling emergencies that occur within the on-site office Building 204, and on site.

6.9 DUST CONTROL MEASURES

Dust control measures have been developed to provide guidance for managing fugitive dust that may be produced during field activities. Dust control measures are provided as Appendix M.

6.10 PROTECTION OF RIPARIAN AREAS

Field activities associated with USEPA's proposed action at the SSFL site will occur within riparian habitat within Area VI and the Northern Buffer Zone. Appendix N details the avoidance and minimization measures to be implemented to avoid impacts to riparian resources in the study area. The avoidance and minimization measures were developed in consultation with the California Department of Fish and Game. These measures will be enforced via the presence of USEPA's biological monitors and on-site USEPA staff oversight of the project.

7.0 REFERENCES

Atomics International, 1959. A Division of North American Aviation, Inc., 1059. *Atomics International,* December.

Energy Technology Engineering Center, 2010. History Overview, United State Department of Energy Web Site. http://www.etec.energy.gov/History/Area-IV-History.html

Envicom Corporation, Biological Assessment, Santa Susana Field Laboratory, Area IV Radiological Study, Ventura County. February 2010.

HydroGeoLogic, Inc., 2009. Final Sampling and Analysis Plan, Radiological Background Study, Santa Susana Field Laboratory, Ventura County, California. August, 2009.

HydroGeoLogic, Inc., 2010. Final, Gamma Radiation Scanning, Sampling and Analysis Plan, Area IV Radiological Study, Santa Susana Field Laboratory, Ventura County, California. February, 2010.

National Institute for Occupational Safety and Health, 1985. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. DHHS and NIOSH, Publication No. 85-115.

North American Aviation, Inc., 1960. The North American Story, December.

Occupational Safety and Health Administration, Labor, 2009. 29 CFR Ch. XVII Occupational Safety and Health Standards, 7–1–09 Edition.

Thielking, R., Peeler, B., Baker, G., and Desai, J., 1987, Inspection Report, Rockwell Rocketdyne/Rockwell, NASA Santa Susana Field Lab, June 23.

U.S. Environmental Protection Agency, 2010. Correspondence with Thomas Gallacher, The Boeing Company, RE: Santa Susana Field Laboratory, Ventura County, California, CERCLA Administrative Order on Consent No. 9-2010-05. March 2010.

U.S. Environmental Protection Agency, 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G4, EPA/240/B-06/001. February.

U.S. Environmental Protection Agency, 2002. EPA QA/G-5 Guidance for Quality Assurance Project Plans. December 2002.

U.S. Environmental Protection Agency, 2001. EPA QA/R-5: Requirements for Quality Assurance Project Plans, Final. March 2001.

U.S. Environmental Protection Agency, 1997. Safety Health and Environmental Management Program, Safety Health and Environmental Management Guidelines. Document No. 201R97001 EPA Order 1440.1 and 1440.3: Training Guidelines. November 1997.

U.S. Environmental Protection Agency, 1992. Permits and Permit Equivalency Process for CERCLA On-site Response Actions, OSWER Directive 9355.7.3. February.

U.S. Environmental Protection Agency, 1985. CERCLA Compliance with Other Environmental Statues. Appendix to the proposed 1985 National Contingency Plan. February, 1985.

TABLES

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Table 1.1
Project Milestones

Milestone	Date
Project award	9/21/2009
Receive site access	3/12/2010
Open on-site office	4/5/2010
Begin gamma scanning	7/1/2010
Begin groundwater and surface water sampling	8/17/2010
Begin soil sampling	10/14/2010
Complete groundwater and surface water sampling	4/29/2010
Complete gamma scanning	7/5/2011
Complete soil sampling	8/29/2011
Submit Final Radiological Sampling Report	3/23/2012
Project Complete	4/17/2012

Table 2.1
Roles of Key Project Personnel

Name	Role on the Project	Contact Information
USEPA Region 9		
Don Bandur	Region 9 CO	(415) 972-3721
Craig Cooper	Project Manager	(415) 947-4148
Mary Aycock	Co-Project Manager	(415) 972-3289
Gregg Dempsey	Co-Project Manager	(702) 784-8232
Roger Shura	USEPA Gamma Scanning Expert	(702) 494-7041
DOE		
William Backous	DOE Federal Project Director	(818) 466-8959
Stephanie Jennings	DOE NEPA Document Manager	(818) 466-8162
HGL Project Management Team		
Robert C. Overfelt. P.G., CHMM	AES Program Manager	(818) 876-9631
Eric Evans, P.G.	Project Manager	(518) 877-0390
Chuck Smith	Deputy Project Manager	(913) 317-8860
Trudy Kearney	Procurement Specialist	(703) 736-4532
Historical Site Assessment Team		
Eric Dambaugh, P.G.	Task Manager	(518) 877-0390
Victoria Guvanasen, P.E.	Lead Researcher	(703) 736-4544
Community Involvement		
Kara-Beth Dambaugh	Task Manager	(518) 877-0390
Field Operations		
Steve Vaughn	Field Operations Manager	W: (818) 466-8059 C: (520) 576-4012

Table 5.1
Applicable Environmental Regulations and USEPA Compliance with Substantive Requirements

Item	Source	Standard Requirement Criterion or Limitation	Description	Potential Applicability to USEPA's Proposed Action
			Air Quality	
A1	Ventura County Air Pollution Control District (VCAPCD)	Rules 403, 403.1 and 1186	Regulates permitting required to comply with VCAPCD Rule 50 and South Coast Air Quality Management District rules 403, 403.1, and 1186.	Fugitive dust could be generated from vegetation cutting, vehicular traffic on unpaved roads, and during sampling activities. A VACAPCD permit is not required for these activities. U.S. Environmental Protection Agency (USEPA) will comply with the substantive requirements by implementing dust suppression measures, as described in Appendices E and M.
			Fire	
F1	Ventura County Fire Protection District (VCFPD), State of California	VCFPD, State of California Ordinance No. 26	Regulates storage and handling of combustible materials, and conducting an activity considered to be hot work. Regulates fire extinguishers and refueler truck equipment. Codifies requirements for obtaining hot work permits.	Small quantities of combustible materials may be stored and transported during the USEPA action at the Santa Susana Field Laboratory (SSFL) site, such as fuel and various solvents and cleaning solutions used in the repair and maintenance of equipment. Activities defined as hot work are vegetation removal, storing of hazardous and combustible material and welding for equipment repair. This ordinance also requires that fire extinguishers be available at appropriate locations including Building 204, in vehicles, and field work areas. Monthly inspection of fire extinguishers will be performed by Boeing with annual inspections conducted and documented by a licensed third party. This ordinance impacts vegetation cutting and welding activities that may be conducted for equipment modification or repair. USEPA protocols to address the substantive requirements of this ordinance are addressed in Appendix E, I, K, L and in the Site Safety and Health Plan (SSHP).
			Hazardous Waste	
H1	Resource Conservation and Recovery Act (RCRA)	Identification and Listing of Hazardous Wastes Title 22, California Code of Regulations (CCR), Division 4.5, Chapter 11	RCRA was established in 1976 to control the generation, transportation and management of solid and hazardous wastes. Establishes and defines procedures and criteria for identification and listing of RCRA and non-RCRA hazardous waste.	Small quantities of potentially hazardous waste may be generated during the USEPA action in the form of soils displaced or collected during subsurface soil sampling; soils washed from survey equipment during decontamination; removed vegetation; used personal protective equipment and disposable sampling equipment; and monitoring well purge water and decontamination rinse water. USEPA's plan to manage potentially hazardous waste and comply with the substantive requirements of this regulation are detailed in Appendix J.
			Water	
W1	Los Angeles Regional Water Quality Control Board (RWQCB).	The State Water Resources Control Board Resolution 88-63, California Water Code and Los Angeles RWQCB Basin Plan.	Regulates permitting required to comply with The State Water Resources Control Board Resolution 88-63, and Los Angeles RWQCB Basin Plan	Compliance impact activities are groundwater, surface water and sediment sampling. USEPA will comply with substantive requirements by Best Management Practices that are addressed in the groundwater/surface-water/sediment Field Sampling Plan (FSP) and Appendix J.
W2	Porter-Cologne Act, California Water Code	Sections 13241, 13260, 13267, and 13269	Regulates water quality objectives and guidelines needed to comply with Porter-Cologne Act Sections 13241, 13260, 13267, and 13269, to ensure reasonable protection of beneficial uses of water.	Compliance impact activities are groundwater, surface water and sediment sampling. USEPA will comply with substantive requirements by BMPs that are addressed in the groundwater/surface-water/sediment FSP and Appendix J.
W3	Safe Drinking Water Act (SDWA)	40 Code of Federal Regulations [CFR] Part 141, 42 U.S.C. 300f et seq.	Regulates chemical-specific water quality objectives and guidelines needed to comply with the SDWA under National Oil and Hazardous Substances Pollution Contingency Plan sections (40 CFR Part 141), 42 United States Code (USC) 300f et seq. to ensure National primary chemical-specific drinking water standards.	Compliance impact activities are groundwater, surface water and sediment sampling. USEPA will comply with substantive requirements by BMPs that are addressed in the groundwater/surface-water/sediment FSP and Appendix J.
W4	California SDWA	CCR Title 22, Division 4, Chapter 15, Articles 4, 5.5, and 8	These requirements (State maximum contaminant levels) are summarized in the Proposed Plan. Regulates chemical-specific water quality objectives and guidelines needed to comply with the California Safe Drinking Water Act under sections CCR Title 22, Division 4, Chapter 15, Articles 4, 5.5, and 8 to ensure California primary drinking water standards.	Compliance impact activities are groundwater, surface water and sediment sampling. USEPA will comply with substantive requirements by implementing BMPs that are addressed in the FSP for Groundwater, Surface Water, and Sediment Sampling, and managing potentially hazardous waste as detailed in Appendix J.
W5	USEPA department: USEPA administration permit programs	Title 40 National Pollution Discharge Elimination System (NPDES) Permit 40 CFR 122.26	Regulates permitting required to comply with Title 40 NPDES Permit 40 CFR 122.26.	Compliance impact activities are groundwater, surface water and sediment sampling. USEPA will comply with substantive requirements by BMPs that are addressed in the groundwater/surface-water/sediment FSP and Appendix J.
W6	Storm Water Pollution Prevention Plan	Water Quality Order 99-08 DWQ	Regulates permitting as needed to comply with Water Quality Order 99-08 DWQ.	Compliance impact activities are groundwater, surface water and sediment sampling. USEPA will comply with substantive requirements by BMPs that are addressed in the groundwater/surface-water/sediment FSP and Appendix J.

Table 5.1 (Continued)
Applicable Environmental Regulations and USEPA Compliance with Substantive Requirements

Item	Source	Standard Requirement Criterion or Limitation	Description	Potential Applicability to USEPA's Proposed Action
Biologic				
B1	Endangered Species Act (ESA)	Section 7 of the ESA (50 CFR 402; 16 U.S.C. 1536 (c), Section 9(b) subsections (a)(1)(A) and (a)(1)(G), 16 USC § 1538(b)(1), Section 4: 48 Federal Register 24062, 24066 (June 14, 1976); 50 C.F.R. § 17.11. Section 9(a)(1)(A)	The ESA of 1973 (16 USC 1531 et seq.) requires action to conserve endangered species and preserve or restore a critical habitat.	Portions of the SSFL site are designated as critical habitat for the threatened species. This Act impacts all field activities conducted by USEPA at the SSFL site. USEPA's protocols to address requirements of this Act are described in Appendix E, G, and N.
B2	California Endangered Species Act (CESA)	14 CCR, Division 1, Subdivision 3, Chapter 6.	Regulations for Implementation of the CESA are applicable to the threatened and endangered species.	Portions of the SSFL site are designated as critical habitat for the threatened species. This Act impacts all field activities in conducted by USEPA at the SSFL site. USEPA's protocols to address requirements of this Act are described in Appendix E, G, and N.
B3	California Fish and Game Code Section 2080	14 CCR, Division 1, Subdivision 3, Chapter 6, Regulations for Implementation of the CESA	This regulation prohibits the importing, exporting, taking, possessing, purchasing, or selling of any species or part or product thereof that is determined to be endangered or threatened, or attempt any of those acts.	Portions of the SSFL site are designated as critical habitat for the threatened species. This Act impacts all field activities in conducted by USEPA at the SSFL site. USEPA's protocols to address requirements of this Act are described in Appendix E, G, and N.
Transportation				
T1	Hazardous Materials Transportation Act of 1974	49 CFR 171-174, 177	Empowers the U.S. Department of Transportation to regulate transport of hazardous materials including hazardous waste. The Act includes requirements for emergency spill response, shipping, containerization, placarding, and manifesting of hazardous materials when transported by road, rail, ship, and air.	If materials are identified as hazardous, this Act could impact the transportation of samples and hazardous waste. If hazardous waste is generated through site activities it will be managed by a licensed waste broker. The substantive requirements of this Act are addressed in Appendix J.
T2	California Law Health and Safety Code on Transportation	California Health and Safety Code, Division 20, Chapter 6.5, Article 6, Transportation, Section 25160-25166.5	California Law Health and Safety Code on Transportation addresses transportation manifest requirements for Hazardous Waste transportation in California.	If any materials are identified as hazardous, this Act could impact the transportation of samples and hazardous waste. If hazardous waste is generated through site activities it will be managed by a licensed waste broker. The substantive requirements of this Act are addressed in Appendix J.
Cultural				
C1	National Environmental Policy Act (NEPA)	(NEPA; Public Law (PL) 91-190, 42 USC 4371 et seq.)	Codifies requirements to "preserve important historic, cultural, and natural aspects of our national heritage…" (NEPA Section 101(b)(4)).	This regulation does not directly apply to USEPA's proposed action. No sampling will be conducted within 50 feet of culturally significant sites identified during field surveys conducted by the site tenant. Field teams will be trained to identify potential cultural objects, and will not disturb, remove, or collect any artifacts. A Cultural resources monitor has been retained to monitor site work as necessary. If any unsurveyed artifacts or sites are identified that may be culturally significant, the Cultural Monitor will be consulted. Cultural resources protection measures are detailed in Appendix F.
C2	National Historic Preservation Act (NHPA)	NHPA; (PL 89-655, as amended through 2006, 16; USC 470 et seq.)	NHPA requires that National Aeronautics and Space Administration consider the effect of its actions on cultural resources that are eligible for inclusion in the National Register of Historic Places.	This regulation does not directly apply to USEPA's proposed action. No sampling will be conducted within 50 feet of culturally significant sites identified during field surveys conducted by the site tenant. Field teams will be trained to identify potential cultural objects, and will not disturb, remove, or collect any artifacts. A Cultural resources monitor has been retained to monitor site work as necessary. If any unsurveyed artifacts or sites are identified that may be culturally significant, the Cultural Monitor will be consulted. Cultural resources protection measures are detailed in Appendix F.
C3	Archeological Resources Protection Act (ARPA)	ARPA (PL 96-95, 16 USC 470aa-470mm)	Prohibits the excavation, collection, removal, and disturbance of archeological resources (as defined by ARPA) and objects of antiquity (as referenced in the Antiquities Act) on federally owned property without a permit issued by the appropriate Federal agency.	This regulation does not directly apply to USEPA's proposed action. No sampling will be conducted within 50 feet of culturally significant sites identified during field surveys conducted by the site tenant. Field teams will be trained to identify potential cultural objects, and will not disturb, remove, or collect any artifacts. A Cultural resources monitor has been retained to monitor site work as necessary. If any unsurveyed artifacts or sites are identified that may be culturally significant, the Cultural Monitor will be consulted. Cultural resources protection measures are detailed in Appendix F.

Table 5.1 (Continued)
Applicable Environmental Regulations and USEPA Compliance with Substantive Requirements

Item	Source	Standard Requirement Criterion or Limitation	Description	Potential Applicability to USEPA's Proposed Action
Safety and Health				
S1	Occupational Safety and Health Administration (OSHA)	29 USC 653, 41 U.S.C. 35 et seq., 40 U.S.C. 333, 33 U.S.C. 941, 20 U.S.C. 951 et seq., 42 U.S.C. 2021, Appendix A to 29 CFR 1910.147, Appendix A to 29 CFR 1915, Subpart P, Appendix E to 29 CFR 1926, Subpart M	Regulates and enforces safety and health standards in the workplace.	USEPA has developed a SSHP has been developed to address overall health and safety requirements for USEPA employees. USEPA's agent, HGL, has developed an SSHP to address health and safety requirements for employees and subcontractors conducting work under USEPA's proposed action.
S2	Emergency Planning and Community Right-to-Know Act	42 U.S.C. 11001 et seq.	The purpose of these requirements is to increase community awareness of chemical hazards and to facilitate emergency planning. This section applies to any facility that is required by the OSHA under its Hazard Communication Standard to prepare or have available a Material Safety Data Sheet for a hazardous chemicals.	The SSHP addresses this Act and Material Safety Data Sheets will be made public in the site building.
S3	Department of Energy (DOE)	40 CFR Part 61, Subpart H DOE Order 5400.5	DOE Order 5400.5, *Radiation Protection of the Public and the Environment* limit the dose to an individual from a single site from airborne radionuclide emissions to 10 mrem/yr (0.1 mSv/yr).	Radiation protection is addressed in the SSHP.

Notes:
ARPA – Archeological Resources Protection Act
CCR - California Code of Regulations
CESA – California Endangered Species Act
CFR - Code of Federal Regulations
DOE – Department of Energy
ESA – Endangered Species Act
FSP – Field Sampling Plan
NEPA – National Environmental Policy Act
NHPA – National Historic Preservation Act
NPDES – National Pollutant Discharge Elimination System
PL – Public Law
RCRA – Resource Conservation and Recovery Act
RWQCB – Regional Water Quality Control Board
SDWA – Safe Drinking Water Act
SSFL – Santa Susana Field Laboratory
SSHP – Site Safety and Health Plan
USC – United States Code
USEPA - U.S. Environmental Protection Agency
VCAPCD - Ventura County Air Pollution Control District
VCFPD- Ventura County Fire Protection District

FIGURES

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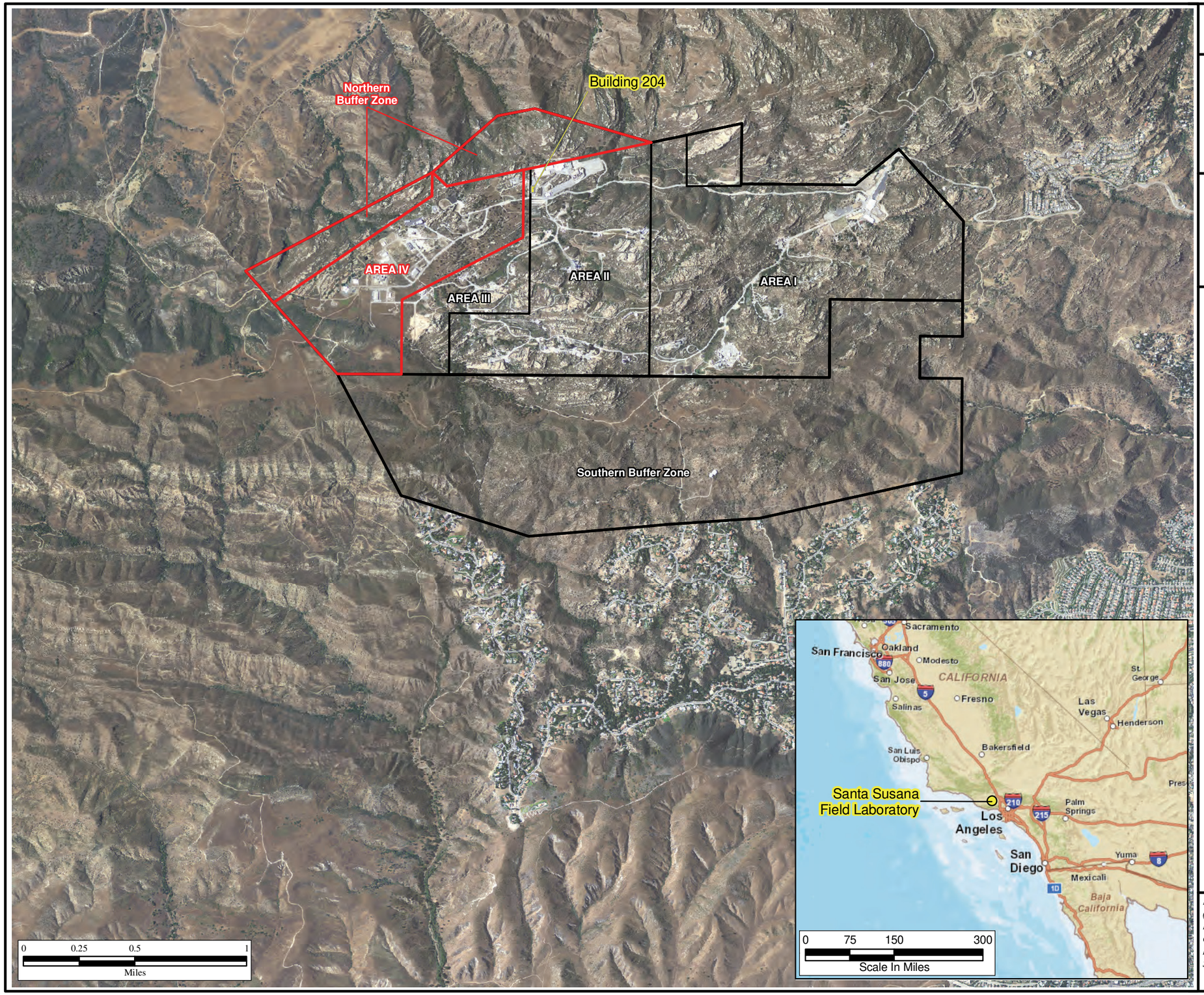
Figure 1.1
Site Location Map
Santa Susana Field Laboratory

U.S. EPA Region 9



Legend

- Area IV and Northern Buffer Zone
- Santa Susana Field Laboratory Property Boundary
- Building 204 (HGL Field Office)

N

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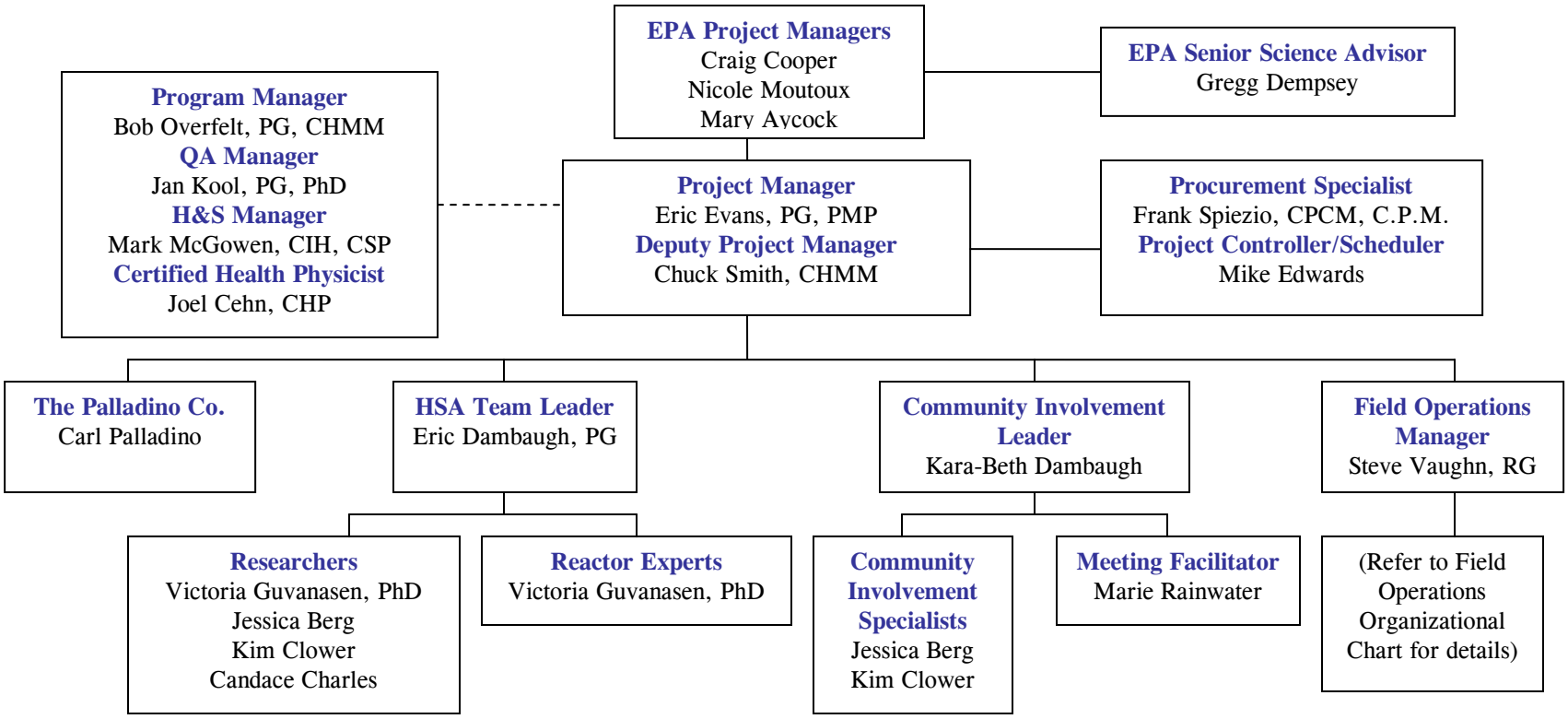
Created: CLimoges 20100322
Revised: CLimoges 20100329
Source: CaSil, NAIP 2009; Boeing, 2008

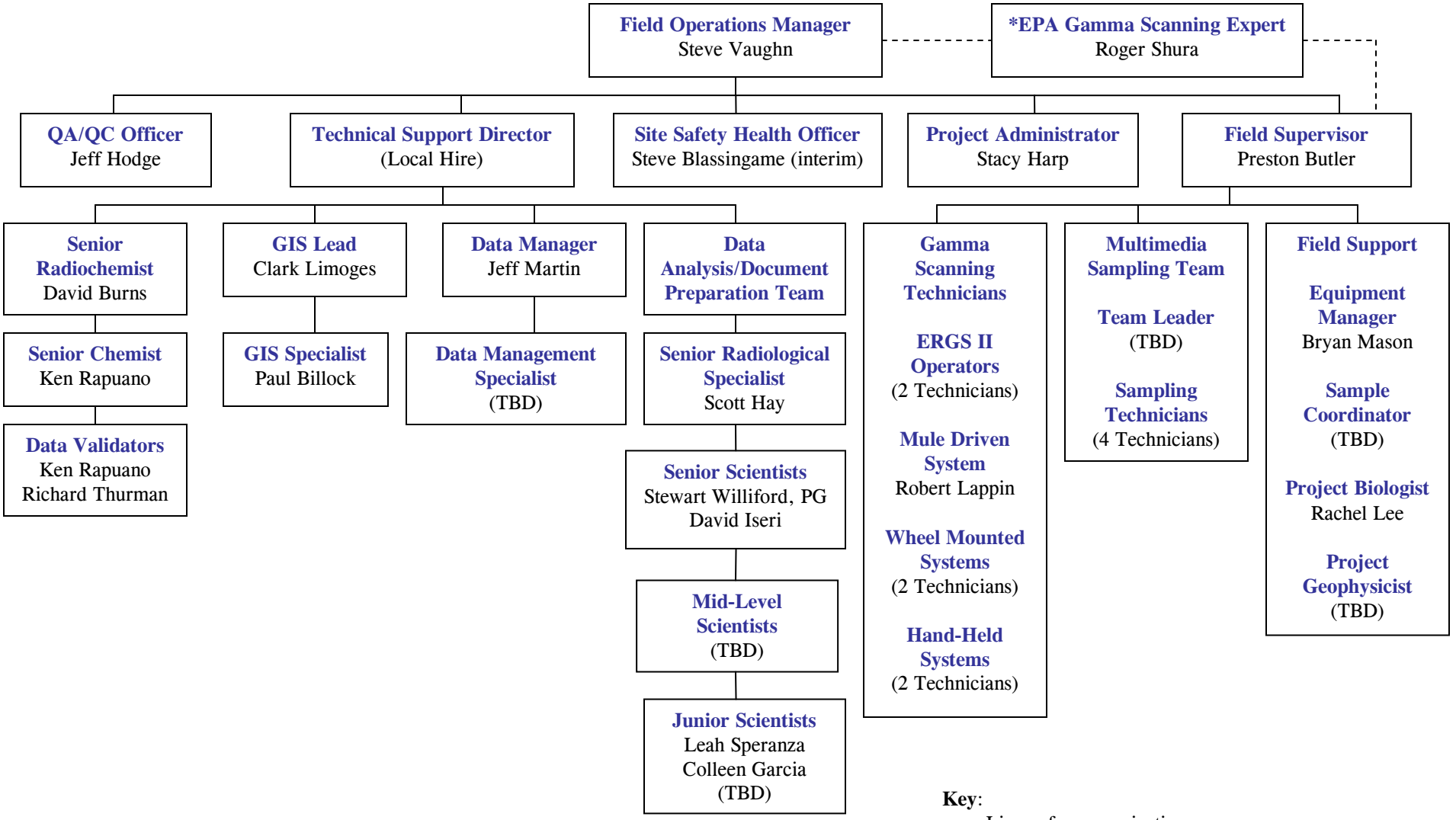
HGL HydroGeoLogic, Inc

Figure 2.1a
Project Organizational Structure

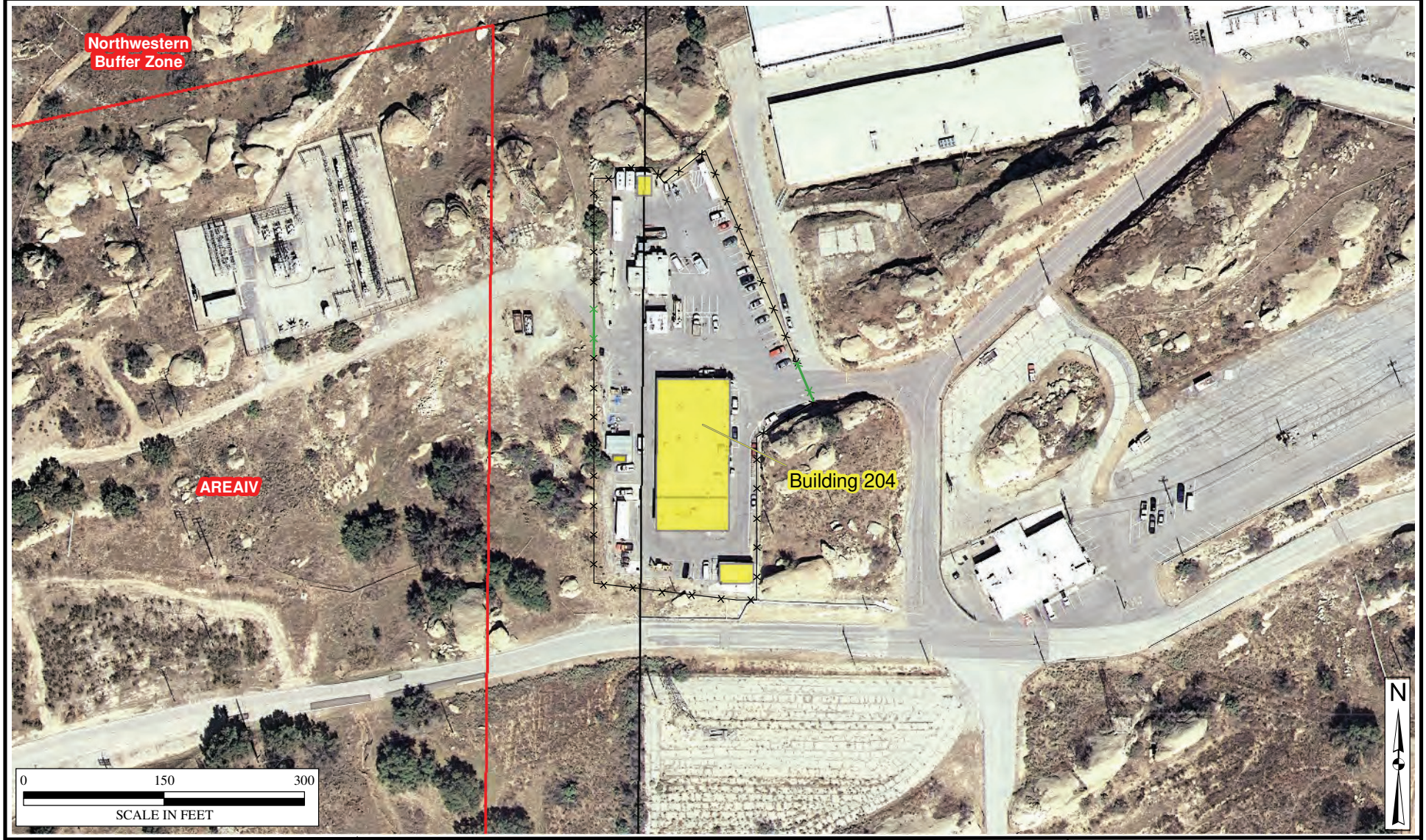


Key:
- - Lines of Communication
--- Lines of Authority
TBD - To be determined

Figure 2.1b
Field Operations Organizational Chart



Key:
- - Lines of communication
--- Lines of authority
TBD – To be determined
RSO – Radiation Safety Officer
See designated responsibilities on attached table
*EPA Gamma Scanning Expert reports to the EPA Project Managers



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Revised: CLimoges 20100329
Source: CaSil, NAIP 2009; Boeing, 2008

HydroGeoLogic, Inc

Legend

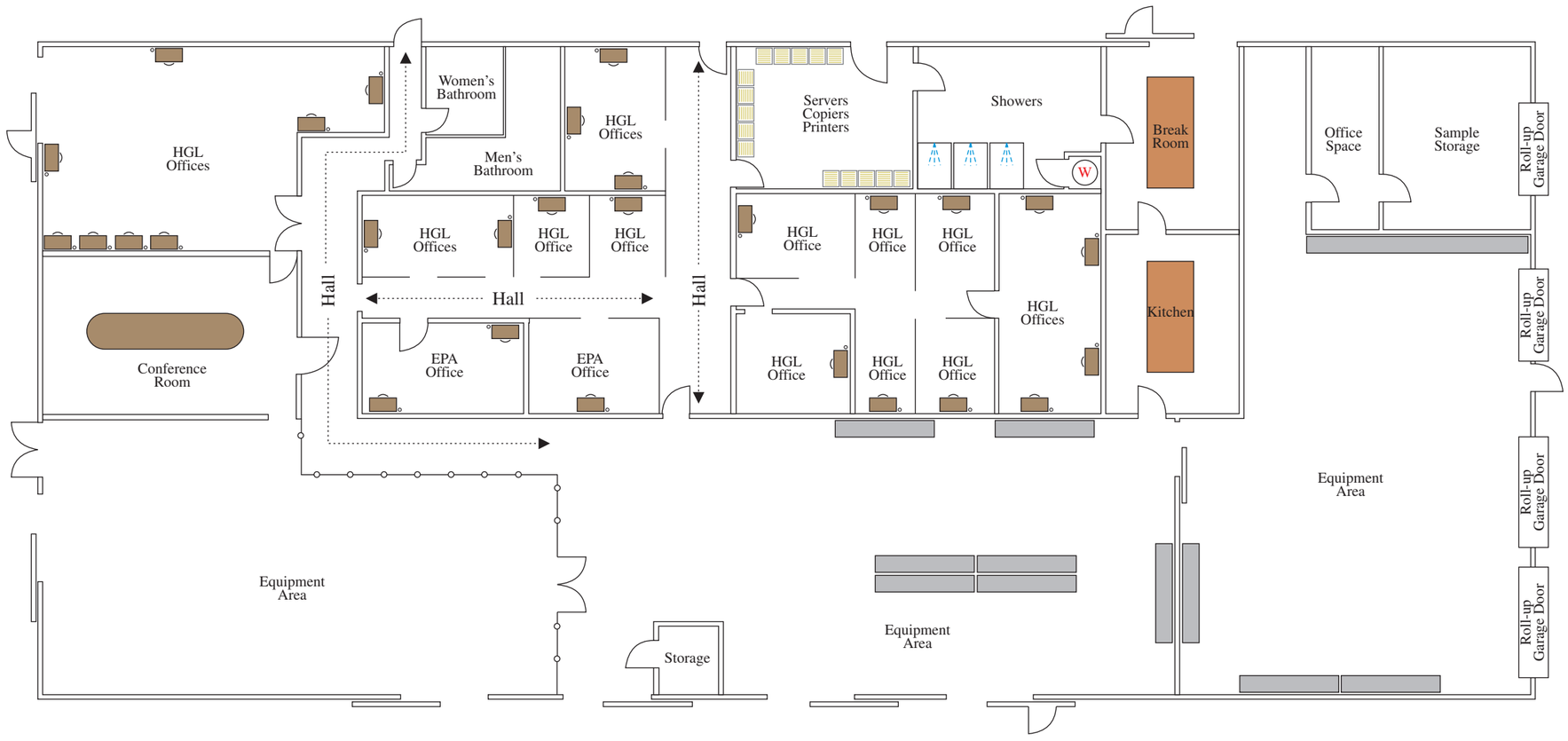
- Area IV and Northwestern Buffer Zone
- Santa Susana Field Laboratory Property Boundary
- Buildings Occupied by HGL
- Fence
- Gate

Figure 4.1
On-site Office Property Layout

U.S. EPA Region 9

Figure 4.2
Floor Plan of On-site Office
Former Santa Susana
Field Laboratory

U.S. EPA Region 9



Legend

- Desk, Chair, and Garbage Can
- Workbench
- Conference Table
- Table
- File Cabinet
- Shower
- W — Hot Water Heater

N

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Project: EP9038
Created by: CLimoges 20100111
Revised: CLimoges 20100329
Source: HGL

APPENDIX A

CORRESPONDENCE WITH VENTURA COUNTY SUPERVISOR LINDA PARKS

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 23, 2009

Ms. Linda Parks
Ventura County Supervisor, 2nd District
Government Center, Hall of Administration
800 South Victoria Avenue
Ventura, California 93009

Re: Santa Susana Field Laboratory Radiological Surveys

Dear Supervisor Parks:

I would like to thank you for your letter of May 28, 2009 to Administrator Jackson concerning EPA's radiological surveys at the Santa Susana Field Laboratory Site (SSFL). I am responding to your letter on her behalf.

We at EPA are aware and very sensitive to the incidences of cancer in the Oak Park area and other residential areas surrounding SSFL. We also understand that numerous residents are concerned about the extent of historic releases of radiological contaminants associated with the past operations at SSFL. We are coordinating your request with the State agency that is responsible for all site investigation and cleanup decisions. The lead regulatory agency for the investigation and cleanup of the SSFL site is the State of California Department of Toxic Substances Control (DTSC).

EPA's role at this site is limited to the scope identified in the 2008 appropriations law, H.R. 2764. H.R. 2764 appropriated funds to Department of Energy (DOE) for environmental remediation activities at SSFL and required that a portion of those funds be used by DOE to enter into an interagency agreement with EPA to conduct a joint comprehensive radiological survey of Area IV of the SSFL. Consistent with H.R. 2764, EPA recently received funding from DOE to conduct the radiological study in SSFL Area IV and an adjacent area to the north of the site called the northern buffer zone.

We will begin this work using state-of-the art technologies to scan Area IV and the northern buffer zone for potential residual gamma radiation in near-surface soils. As results from this activity become available, EPA will plan our soil and water testing program. EPA will begin its soil and water investigations in on-site areas where the original spills and releases of contaminants occurred. If data obtained from these on-site sample collection activities indicate a need for testing off-site residential areas, we will work closely with DTSC, the lead regulatory agency for SSFL, to include collection of data in these areas.

Thank you again for your letter and your ongoing efforts to support the investigation and cleanup of the SSFL site. If you have any questions or concerns, please contact me or your staff may contact Mr. Jim Vreeland, Congressional Liaison, at (415) 947-4298 or the EPA Project Manager for the site, Mr. Craig Cooper at (415) 947-4148.

Sincerely,

Michael M. Montgomery
Assistant Director
Federal Facilities and Site Cleanup Branch

Cc: Norman Riley, DTSC

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LINDA PARKS
SUPERVISOR, SECOND DISTRICT
(805 373-2564
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E-mail: Linda.Parks@ventura.org

May 28, 2009

Ms. Lisa Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Santa Susana Field Laboratory Radiological Surveys

Dear Ms. Jackson:

I represent a Ventura County District that is adjacent to the Santa Susana Field Laboratory (SSFL). Numerous residents have expressed concerns about incidences of cancer in the Oak Park area of my District and are asking if their neighborhood has been contaminated by radioactive materials from the 1959 partial reactor core meltdown or other nuclear activities at SSFL. Last month, approximately 150 residents turned out for a community meeting in Oak Park to discuss this environmental health issue.

To address the concerns of residents who wonder if their yards or water may be contaminated, I request that funding be made available to respond with limited tests of residents' properties when they request testing. This could greatly alleviate unwarranted concerns by residents and show the limits of SSFL contamination. Of course if tests show otherwise, that is important to know.

With the recent agreement with the Department of Energy for radiological surveys as part of the American Recovery and Reinvestment Act, I am hopeful that a small portion could be allocated to help get resolution to a community-wide concern.

Thank you for your consideration of this important matter.

Sincerely,

Linda Parks
Ventura County Supervisor, 2nd District

cc: Laura Yoshii, Acting Regional Administrator, Region 9
Craig Cooper, Project Manager, EPA
Nicole Moutoux, Project Manager, EPA

Recycled Paper

APPENDIX B

SIGNED USEPA/GSA ACCESS AGREEMENT AND MEMORANDUM OF UNDERSTANDING TO OCCUPY BUILDING 204

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GSA

GSA Northwest/Arctic Region

Mr. Keith Takata, Director
Superfund Division, U.S. EPA Region 9
75 Hawthorne Street
San Francisco, CA, 94105

December 8, 2009

Dear Mr. Takata:

This letter responds to your agency's request to acquire certain excess federal real property at the Santa Susana Field Laboratory (SSFL or Santa Susana) for use in conducting a radiological survey of Santa Susana Area IV and the northern buffer area. The real property requested includes Building 204 and outbuildings on the paved area as depicted in the attached Exhibit A (the Property).

Under the authority vested in the Administrator of General Services by 40 USC 101 et seq., and 41 CFR § 102-75.240, I hereby transfer the Property to the Environmental Protection Agency (EPA) effective Monday January 4, 2010.

This transfer is temporary and conditional such that when EPA no longer needs the Property for the purpose of conducting a radiological survey of Area IV and the northern buffer area, EPA will report the Property excess to the General Services Administration (GSA). The Property is transferred to EPA rent free, however, EPA is responsible for all costs and expenses attributable to its use and occupancy of the Property, including but not limited to security, maintenance and utilities.

Under no circumstances shall EPA be liable under CERCLA solely as a result of this temporary transfer. EPA will implement appropriate procedures for decontamination of all equipment and will follow site-specific plans to cleanup any spills of soil, water samples or other material brought onto the Property as part of the EPA work. Prior to reporting the Property excess to GSA, EPA shall conduct an investigation, satisfactory to GSA, to determine whether its use or occupancy has resulted in any contamination of the Property.

GSA requests that you acknowledge and accept this transfer in the space provided on the enclosed copy of this letter and return it to this office, and that such steps as necessary be taken by your Agency to consummate this transaction.

Sincerely,

I. Blaine Hastings
GSA Contracting Officer

Custody and Accountability Accepted by EPA

Signature _____

Name & Date 12.22.09

U.S. General Services Administration
Real Property Division
450 Golden Gate Ave.
San Francisco, CA 94102-3434
www.gsa.gov

EXHIBIT-A

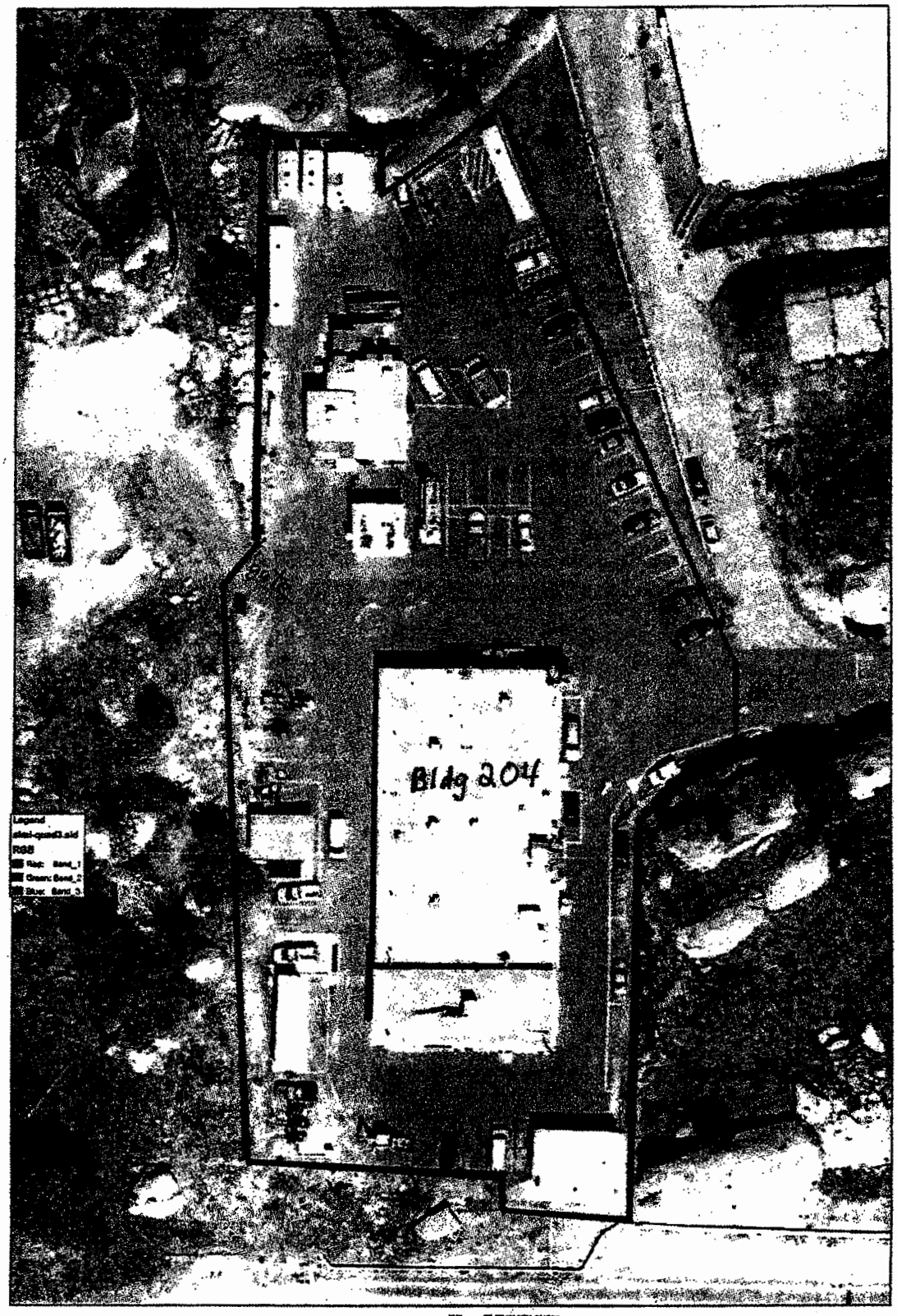

EXHIBIT A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

March 12, 2010

Thomas D. Gallacher
Director, Environmental Health and Safety
The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304

Re: Santa Susana Field Laboratory, Ventura County, California
CERCLA Administrative Order on Consent No. 9-2010-05

Dear Mr. Gallacher:

I have signed and am transmitting the above-referenced CERCLA Administrative Order on Consent (AOC). This Order requires The Boeing Company to provide access to the Santa Susana Field Laboratory (SSFL) in order that EPA may conduct its radiological survey of portions of SSFL. The Order also requires Boeing to "participate and cooperate" with EPA's efforts by undertaking certain actions set forth in the Statement of Work (Attachment A to the AOC) (SOW). Pursuant to Paragraph 49 of the AOC, the AOC is effective today, March 12, 2010.

I sincerely appreciate the efforts made by Boeing representatives over the last six months that have resulted in completion of this AOC and attached SOW. Together, these documents should go a long way toward ensuring that EPA is able to efficiently and expeditiously conduct its investigation at SSFL. EPA looks forward to the continued cooperation of Boeing in this matter as EPA begins its on-site activities this month. If you have any legal questions about the enclosed Order, please contact John Lyons of EPA Region IX's Office of Regional Counsel at (415) 972-3889. Technical questions should be directed to Craig Cooper, Superfund Remedial Project Manager, at (415) 947-4148.

Sincerely,

Michael Montgomery
Assistant Director
Federal Facilities & Site Cleanup Branch
Superfund Division

cc: Rick Brausch, California Department of Toxic Substances Control

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IX

IN THE MATTER OF: Santa Susana Field Laboratory, Ventura County, California The Boeing Company, RESPONDENT Proceeding Under Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. § 9604, 9607 and 9622	ADMINISTRATIVE ORDER ON CONSENT FOR ACCESS AND PARTICPATION/COOPERATION WITH EPA RESPONSE ACTIONS U.S. EPA Region IX CERCLA Docket No. 9-2010-05

I. JURISDICTION

1. This Administrative Order on Consent (Order) is entered into voluntarily by the United States Environmental Protection Agency (EPA) and The Boeing Company (Respondent). EPA is issuing this Order pursuant to the authority vested in the President of the United States by Sections 104, 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9604, 42 U.S.C. § 9607 and 42 U.S.C. § 9622, and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. § 300.400(d)(4). This authority was delegated to the Administrator of the United States Environmental Protection Agency (EPA) on January 23, 1987, by Executive Order 12580, 52 Fed. Reg. 2923, and redelegated to the Regional Administrators of EPA on May 11, 1994, by EPA Delegation No. 14-14-B, 14-14C and 14-14D. The Region IX Regional

Administrator further delegated the authority to the Region IX Superfund Branch Chiefs (now titled Assistant Directors) on November 16, 2001 through Regional Delegation R9 1290.14A and 1290.43A.

II. STATEMENT OF PURPOSE

2. This Order requires Respondent to grant EPA and its authorized representatives entry and access (as set forth in the attached Statement of Work, Attachment A to this Order) to the Santa Susana Field Laboratory (SSFL or Site) located in Ventura County, California, for the purpose of taking an investigation of radiological contamination in SSFL Area IV and the adjacent northern buffer zone of SSFL. The EPA investigation will include a Historical Site Assessment, Gamma scan of accessible areas, sampling of soil, groundwater and surface water and related activities. This Order also requires Respondent to refrain from interfering with access to the property by EPA and its authorized representatives for the purposes set forth herein. Further, this Order requires Respondent to participate and cooperate with EPA's investigation as set forth in the Statement of Work (Attachment A to this Order).

3. EPA and Respondent recognize that this Order has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Order do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Order, the validity of the findings of fact, conclusions of law and determinations in Sections III and IV of this Order, and otherwise reserves its rights with respect to the Site. Respondent agrees to comply with and

be bound by the terms of this Order and further agrees, that Respondent will not contest the basis or validity of this Order or its terms.

III. FINDINGS OF FACT

4. SSFL consists of 2,850 acres which have been divided into four administrative areas (Areas I, II, III and IV) along with a northern and southern buffer zone portion of the facility. Area IV consists of the westernmost 290 acres of SSFL and the northern buffer zone consists of approximately 182 acres.

5. Respondent owns the real property within SSFL Area IV and the adjacent SSFL buffer zone areas where EPA will be conducting its investigation. Respondent owns most of the SSFL Area I property and all of the Area III property. The United States owns 482 acres of SSFL (all of Area II and a portion of Area I). DOE contracted with Respondent to conduct nuclear energy research and related activities within a 90 acre portion of Area IV known as the Energy Technology Engineering Center.

6. EPA will be conducting a radiological survey in Area IV and the adjacent northern buffer zone with funding from an Interagency Agreement with the United States Department of Energy (DOE). Respondent controls access into and from the areas of SSFL where EPA will be conducting its work.

7. Available information indicates that SSFL Area IV historically was used for operations related to the testing and operation of nuclear reactors and related projects. Other facilities in Area IV included nuclear material critical test, storage, and handling facilities. There were ten nuclear reactors, including the Sodium Reactor Experiment, that were, at various times

located and operated within SSFL Area IV. There are documented historic releases of radiological materials from nuclear reactors during operations at SSFL.

8. Prior investigations have found elevated levels of chemical and radiological contaminants in SFFL Area IV including, but not limited to, the following: metals, chlorinated solvents, Plutonium 238, Uranium 235, Cesium 137, tritium and Strontium 90.

9. At this time, most active operations in SSFL Area IV have ceased, although Respondent has some active operations in Area IV.

10. To address the release or threatened release of a hazardous substance at SSFL, EPA is conducting certain response actions. The EPA response actions will include a Historical Site Assessment, Gamma scan of accessible areas, sampling of soil, groundwater and surface water and related activities. Combined, these investigatory actions constitute a radiological survey to determine the nature and extent of radiological contamination within and originating from historic activities at SSFL Area IV.

11. To perform the response actions described above, it will be necessary for EPA employees, agents, contractors, and other representatives of EPA to enter SSFL. The activities for which entry to SSFL is required include: activities related to preparing a Historical Site Assessment, preparing for and performing Gamma scans of accessible areas, sampling of soil, groundwater and surface water (and related activities), and conducting any other related activities deemed necessary by EPA.

12. EPA estimates that the duration of the required entry and access will be through December 23, 2011. During this time, EPA will also need Respondent, on an ongoing basis, to participate and cooperate with EPA (and as directed by EPA in accordance with the

Scope of Work in Attachment A) so that EPA can perform its work and perform it in a timely manner.

13. EPA is performing the investigatory work pursuant to its authority under CERCLA, as delegated to EPA by the President. EPA is performing this investigatory work at the request of the California Department of Toxics Substances Control (DTSC), and the Department of Energy (DOE) with funds provided by DOE under the American Recovery and Reinvestment Act of 2009 (Public Law 111-5). DTSC is the lead agency with the responsibility for determining whether cleanup actions are required at SSFL, selecting cleanup actions and overseeing the implementation of selected cleanup actions. DSTC is planning to use the results of EPA's investigation in making its determinations regarding the need for and type of cleanup that will be conducted at SSFL. In August 2007, Boeing, DOE and NASA entered into a Consent Order with DTSC for investigation and cleanup of chemical contamination at SSFL.

14. The response actions described in paragraphs 2 and Attachment A must be performed immediately because EPA and DTSC need the sampling results in order to define and understand the extent of radiological contamination at and originating from SSFL Area IV or the adjacent SSFL buffer zone areas. These sampling results are necessary in order to assess the need for, evaluate potential cleanup actions and select cleanup actions for the Site.

IV. CONCLUSIONS OF LAW AND DETERMINATIONS

15. SSFL is a "facility" within the meaning of Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

16. Respondent is a "person" within the meaning of Section 101(21) of CERCLA, 42

U.S.C. § 9601(21).

17. All of the substances listed in Paragraph 8 above are hazardous substances or pollutants or contaminants within the meaning of Sections 101(14) of CERCLA, 42 U.S.C. §§ 9601(14).

18. Based on the information provided in Paragraphs 7 and 8 of this Order, EPA has a reasonable basis to believe that there may be a release or threat of release of a hazardous substance or pollutant or contaminant, within the meaning of Sections 101(22) and 104(e)(1) of CERCLA, 42 U.S.C. §§ 9601(22) and 9604(e)(1), at SSFL.

19. The property owned or controlled by Respondent, referred to in Paragraph 4 above, are facilities:

a. from or to which a hazardous substance or pollutant or contaminant has been or may have been released; and

b. where such release is or may be threatened; and

c. where entry and access is needed to determine the need for response, to identify the appropriate response, or to effectuate a response action

within the meaning of Section 104(e)(3) of CERCLA, 42 U.S.C. § 9604(e)(3).

20. Entry and access to property owned or controlled by Respondent is needed by the EPA employees, agents, contractors, subcontractors or other representatives of the United States for the purposes of undertaking taking a response action, within the meaning of Section 104(e)(1) of CERCLA, 42 U.S.C. § 9604(e)(1).

21. Respondent, The Boeing Company, is an "owner" and/or "operator" of the Facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the

meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

22. The actions required by this Order are necessary to protect the public health, welfare or the environment, are in the public interest, 42 U.S.C. § 9622(a), are consistent with CERCLA and the NCP, 42 U.S.C. §§ 9604(a)(1), 9622(a), and will expedite effective response action and minimize litigation, 42 U.S.C. § 9622(a).

23. EPA has determined that the Respondent is qualified to conduct the actions required of Respondent by this Order within the meaning of Section 104(a) of CERCLA, 42 U.S.C. § 9604(a), and will carry out such actions properly and promptly, in accordance with Sections 104(a) and 122(a) of CERCLA, 42 U.S.C. §§ 9604(a) and 9622(a), if Respondent complies with the terms of this Order.

V. ORDER

24. Based upon the foregoing Findings of Fact, Conclusions of Law and Determinations, Respondent is hereby ordered to provide EPA and its officers, employees, agents, contractors, subcontractors and other representatives, access at all reasonable times to its real property at SSFL (as set forth in Attachment A) for the purpose of conducting response activities, including but not limited to preparation of a historical site assessment, gamma scanning of accessible areas, conducting sampling, and conducting any other sampling-related activities deemed necessary by EPA. Respondent is also ordered to participate and cooperate with EPA's investigatory activities as set forth in the attached Statement of Work (Attachment A to this Order). EPA provided notice of the issuance of this Order to the California Department of Toxic Substances Control on February 25, 2010.

25. Consistent with the procedures and responsibilities set forth in this Order and Attachment A to this Order, Respondent shall not interfere with EPA's exercise of its access authorities pursuant to 42 U.S.C. § 9604(e) and 40 C.F.R. § 300.400(d), and shall not interfere with or otherwise limit any activity conducted by EPA pursuant to this Order, its officers, employees, agents, contractors, subcontractors, or other representatives. Any such interference shall be deemed a violation of this Order. EPA may issue a unilateral order to Respondent in the event Respondent's actions interfere with EPA response activities at SSFL or if Respondent denies access to EPA, its representatives, contractors or subcontractors.

26. Nothing herein limits or otherwise affects any right of entry held by the United States pursuant to applicable laws, regulations, permits, or decrees.

27. This Order shall apply to and be binding upon Respondent and its successors, heirs and assigns, and each and every agent of Respondent and upon all other persons and entities who are under the direct or indirect control of Respondent.

28. EPA's Project Coordinators shall have the authority lawfully vested in a Remedial Project Manager ("RPM") and On-Scene Coordinator ("OSC") by the NCP. In addition, EPA's Project Coordinators shall have the authority consistent with the NCP to take any necessary response action when s/he determines that conditions at the Site may present an immediate endangerment to public health or welfare or the environment. The absence of the EPA Project Coordinator from the area under study pursuant to this Order shall not be cause for the stoppage or delay by Respondent with respect to actions required of Respondent under this Order.

VI. DISPUTE RESOLUTION

29. Unless otherwise expressly provided for in this Order, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Order. The Parties shall attempt to resolve any disagreements concerning this Order expeditiously and informally.

30. If Respondent and EPA identify a disagreement regarding implementation of the attached Statement of Work, Respondent and EPA shall notify each other in writing of such disagreement within three Business days of such action, unless the objection(s) has/have been resolved informally. If Respondent objects to EPA's assessment of stipulated penalties as provided in Paragraphs 36-44 of this Order, Respondent shall notify EPA, in writing, of its objection within seven days after receiving EPA's notice of the assessment of stipulated penalties EPA and Respondent shall have seven days from receipt written objection(s) to resolve the dispute (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA. Such extension may be granted verbally but must be confirmed in writing.

31. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by the Parties, be incorporated into and become an enforceable part of this Order. If the Parties are unable to reach an agreement within the Negotiation Period, an EPA management official at the Assistant Director level or higher will issue a written decision. However, Respondent may request to meet with the EPA management official before that official makes a decision on this dispute. EPA's decision shall be incorporated into and become an enforceable part of this Order. Respondent's obligations under this Order shall not be tolled by

submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs, and regardless of whether Respondent agrees with the decision.

VII. ENFORCEMENT

32. Compliance with this Order shall be enforceable pursuant to Section 104(e)(5) of CERCLA, 42 U.S.C. § 9604(e)(5). A court may impose a civil penalty on Respondent of up to $37,500 for each day that Respondent unreasonably fails to comply with this Order, as provided in Section 104(e)(5) of CERCLA, 42 U.S.C. § 9604(e)(5), and the Civil Monetary Penalty Inflation Adjustment Rule, 69 Fed. Reg. 7121, 40 C.F.R. Part 19.4. In addition, any person who is liable for a release or threat of release of a hazardous substance or pollutant or contaminant and who fails to comply with this Order may be liable for punitive damages in an amount up to three times the amount of any costs incurred by the United States as a result of such failure, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Nothing herein shall preclude EPA from taking any additional enforcement actions, and/or other actions it may deem necessary for any purpose, including the prevention or abatement of a threat to the public health, welfare, or the environment arising from conditions at the Site, and recovery of the costs thereof.

33. Nothing in this Order constitutes a waiver, bar, release, satisfaction of or a defense to any cause of action which EPA has now or may have in the future against Respondent, or against any entity that is not a party to this Order.

34. Nothing in this Order shall affect in any manner the right of EPA to issue any

other orders to or take any other administrative or civil action against Respondent or any other parties under CERCLA that relate to the Site or any other site.

35. Nothing in this Order constitutes a decision on preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2).

VIII. STIPULATED PENALTIES

36. Respondent shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 37 for failure to comply with any of the requirements of this Order specified below unless excused under Section IX (Force Majeure).

37. Stipulated Penalty Amounts - Work.

The following stipulated penalties shall accrue per day for any noncompliance identified with the provisions of Paragraphs 24-28 of this Order or Attachment A to this Order:

Penalty Per Violation Per Day	Period of Noncompliance
$ 100.00	1st through 14th day
$ 500.00	15th through 30th day
$2,500.00	31st day and beyond

38. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue with respect to a decision by the EPA management official designated in Paragraph 31 of Section VI (Dispute Resolution), during the period, if any, beginning on the 21st day

after the Negotiation Period begins until the date that the EPA management official issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Order.

39. Following EPA's determination that Respondent has failed to comply with a requirement of this Order, EPA may give Respondent written notification of the same and describe the noncompliance. EPA may send Respondent a written demand for the payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Respondent of a violation.

40. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondent's receipt from EPA of a demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures in Paragraphs 29 to 31. All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be mailed to:

US Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
PO Box 979076
St. Louis, MO 63197-9000

and shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site/Spill ID Number 09QL, the EPA Docket Number 9-2010-05, and the name and address of the party making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s) shall be sent to EPA to:

John Lyons
Senior Counsel
Office of Regional Counsel
Mailcode ORC3
U.S. EPA Region 9
75 Hawthorne St.
San Francisco, CA 94105

41. The payment of penalties shall not alter in any way Respondent's obligation to complete performance of the Work required under this Order.

42. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

43. If Respondent fails to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 40.

44. Nothing in this Order shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Order or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(l) of CERCLA, 42 U.S.C. § 9622(l), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Order.

IX. FORCE MAJEURE

45. Respondent agrees to perform all requirements of this Order within the time limits established under this Order, unless the performance is delayed by a *force majeure*. For purposes of this Order, *force majeure* is defined as any event arising from causes beyond the control of Respondent or of any entity controlled by Respondent, including but not limited to its contractors and subcontractors, which delays or prevents performance of any obligation under this Order despite Respondent's best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the activity or increased cost of performance of any action required under this Order.

46. If any event occurs or has occurred that may delay the performance of any obligation under this Order, whether or not caused by a *force majeure* event, Respondent shall notify EPA orally within three Business days of when Respondent first knew that the event might cause a delay. Within three Business days thereafter, Respondent shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rational for attributing such delay to a *force majeure* event if it intends to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of *force majeure* for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

47. If EPA agrees that the delay or anticipated delay is attributable to *a force majeure* event, the time for performance of the obligations under this Order that are affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify Respondent in writing of its decision. Respondent may invoke dispute resolution, under Article VI of this Order, if it disagrees with EPA's decision. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

X. EFFECTIVE DATE; COMPUTATION OF TIME

48. Because of the immediate need to conduct the activities described above, this Order shall be effective on the day it is signed by the EPA Assistant Director. EPA will provide an electronic copy of this fully executed Order to Boeing on the day it is signed by EPA.

49. For purposes of this Order, the term "day" shall mean a calendar day unless expressly stated to be a business day. A "Business day" shall mean a day other than a Saturday, Sunday, or federal legal holiday. When computing any period of time under this Order, if the last day would fall on a Saturday, Sunday, or federal legal holiday, the period shall run until the next business day.

50. This Order may be amended by mutual agreement of EPA and Respondent.

Amendments shall be in writing and shall be effective when signed by EPA. EPA Project Managers do not have the authority to sign amendments to the Order. However, the attached Statement of Work (Attachment A to this Order) may be modified in writing by mutual agreement of the Boeing Project Manager and EPA's Project Manager, Craig Cooper. Upon written notice to Respondent, EPA may change the EPA Project Manager identified in this Paragraph and Paragraph 52.

51. No informal advice, guidance, suggestion, or comment by the EPA Project Manager or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Order, or to comply with all requirements of this Order, unless it is formally modified.

XI. TERMINATION

52. This Order shall remain in effect until EPA Remedial Project Manager, Craig Cooper, or his designee notifies Respondent in writing that access to the Property is no longer needed. EPA anticipates that termination of this Order will occur on or before December 24, 2011. The term of this Order may be extended for an additional six months to June 24, 2012 if the Parties to this Order confirm the extension of the term in writing prior to December 24, 2011.

53. The undersigned representative of Respondent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to execute and legally bind Respondent to this Order.

Agreed this 12th day of March 2010.

For Respondent Thomas D. Gallacher on behalf of The Boeing Company

By Thomas D. Gallacher

Title Director, South Sucrose Field Lab

SO ORDERED.

Date: March 12th

Michael Montgomery
Assistant Director
Federal Facilities and Site Cleanup Branch

Attachment A to EPA Administrative Order on Consent No. 09-2010-05
March 2010
Santa Susana Field Lab
EPA Area IV Radiological Study

Background

Pursuant to H.R. 2764, the U.S Environmental Protection Agency (EPA) will conduct a radiological study (hereinafter referred to as "the EPA Work") of residual radiological contamination associated with spills and releases associated with the former Department of Energy (DOE) facility known as the Energy Technology Engineering Center (ETEC) that operated at the Santa Susana Field Laboratory (SSFL) located in eastern Ventura County, California. The EPA Work is being funded by the DOE and study area boundaries consist of SSFL administrative Area IV and the northern undeveloped land (see attached, Figure 1).

Access to Conduct the EPA Work

The EPA Work consists of the following phases:

- Historical Site Assessment
- Gamma scan of all accessible areas within the study area boundaries
- Sampling and testing of surface soil, subsurface soil (including a subsurface geophysical investigation) groundwater, and surface water within and outside the study area boundaries.

Boeing will provide EPA staff, staff of EPA's prime contractor (HydroGeoLogic Inc. or HGL) and other EPA contractors and HGL's subcontractors access to Santa Susana so that the EPA Work can be performed.

EPA representatives and EPA contractors who have Boeing non-employee badges, including certain representatives from HGL and The Palladino Company, will have access to and within Area IV and the northern undeveloped land without needing a Boeing escort, provided such persons have completed the site Safety Orientation Briefing. EPA representatives and certain representatives of HGL and the Palladino Company may escort subcontractors to the jobsite provided they have executed Boeing's Non-Employee Escort Agreement ("Escort Contractors"). EPA intends to keep the number of personnel needing escort privileges to a minimum number necessary to achieve EPA Work objectives. All other contractors and subcontractors must be escorted at all times by a representative of either EPA or an Escort Contractor. Likely contractors or subcontractors include companies to cut and manage vegetation cuttings, drilling, natural and cultural resource monitors, animal handlers, waste disposal contractor, fencing, parcel couriers, radiological experts, and other technical assistance. Boeing and EPA will work cooperatively to prevent interference with EPA, HGL, and their respective contractors' and subcontractors' performance of the EPA Work, and Boeing's use of and ongoing activities on its property, including without limitation

ongoing business activities, closure activities, and remediation work. EPA, HGL and their respective contractors and subcontractors are responsible for protecting their property from theft, loss, casualty or damage.

EPA will need to meet and work on-site with other local, state and federal regulators during the course of performing the EPA Work. Subject to the Security and Health and Safety requirements outlined in this scope of work, Boeing will provide access to any representative of a local, state or federal regulator that requires access, as identified by EPA, to SSFL for a purpose related to the EPA Work including without limitation: California Fish and Game, Department of the Interior, the California Regional Water Quality Control Board and Ventura County.

Unless otherwise cleared with the Boeing Project Manager in advance, EPA, HGL, and their respective contractors and subcontractors will not: 1) access the interior of any buildings on Boeing property, including in Area IV or the northern undeveloped lands; or 2) access the fenced area comprising the Radioactive Materials Handling Facility. If EPA requires access to portions of Boeing property outside of Area IV or the northern undeveloped land for the EPA Work, EPA will coordinate with Boeing regarding such work in advance of performing that work.

Boeing Security Requirements

All persons working at the site must be at least eighteen years of age.

All personnel, including without limitation, visitors, contractors and subcontractors who are U.S. Persons and are not in possession of a "Boeing Non-Employee Badge," will provide 48-hours advance notice to the extent possible, via e-mail to Boeing Santa Susana personnel (mail to: joyce.a.kucinskas@boeing.com).

When providing notice, EPA should include the person's name, their affiliation, their citizenship status, the purpose of the visit and intended route/sites. At the time of entry, the person must have a picture identification issued by a government agency, such as a driver's license, passport or other identification.

Certain assets at SSFL are regulated by the International Traffic and Arms Regulations (ITAR), which controls any access to certain technical data, including without limitation pictures, drawings, videos, or sketches. In order to admit a non-US person onto the site, Boeing's procedures require 96 hours advance notice, to the extent possible, along with a copy of approved documentation such as a passport, green card, etc.

Access to the site is controlled through a gate with Security presence. All members of the public who are not EPA representatives or EPA or HGL contractors or subcontractors must be accompanied by a Boeing representative while on Boeing Property unless the Boeing Project Manager agrees in writing that Boeing accompaniment is not required.

Schedule

Site access is controlled; therefore, work will be scheduled during Boeing's normal business hours, 6:00 am to 5:30 pm Monday through Friday. Overtime, weekend, and holiday work must be confirmed by the Boeing Project Manager prior to scheduling such work to ensure that a Boeing representative can be onsite. Boeing will provide access to Area IV and the northern undeveloped land, including groundwater monitoring wells, to EPA staff, EPA contractors, EPA subcontractors, and, subject to Boeing's security and escort requirements, certain members of the general public (identified by EPA) as provided in this SOW beginning on March 15, 2010 through December 23, 2011. If performance of the EPA Work requires access on the weekends or during other hours during the week, the Boeing Project Manager will work cooperatively with the EPA Project Managers to accommodate EPA's request. Should Boeing and EPA be unable to reach agreement on after-hours access to SSFL that is specifically requested by EPA, either party may invoke the dispute resolution procedures contained in Paragraphs 29-31of the Administrative Order on Consent (EPA Region 9 CERCLA Docket No. 09-2010-05).

The current schedule for EPA's onsite activities commences with EPA's initial mobilization to SSFL on February 15, 2010 for preparation of the EPA field office, equipment storage and waste storage area. Gamma scanning work is anticipated to commence no sooner than March 15, 2010 and is expected to be completed by April 30, 2011. EPA's onsite environmental testing is anticipated to commence by May 1, 2010 and is expected to be completed by August 31, 2011. Upon completion of the EPA Work, EPA, HGL and their respective contractors and subcontractors will vacate the property, having first removed all debris associated with the EPA Work from the property and leaving the property in similar condition to that which it was in at the commencement of their use thereof, normal wear and tear excepted. EPA will not be expected to replace vegetation impacted or removed as part of the EPA Work.

Work Planning and Coordination

Project Managers. Boeing has identified the name and contact information for a project manager (the "Boeing Project Manager") and alternate Boeing Project Manager who will be responsible with Boeing's overall responsibilities under this SOW. Boeing has identified Phil Rutherford as the Boeing Project Manager and Joyce Kucinskas as the alternate Boeing Project Manager. EPA's project managers are as follows:

EPA Project Manager	*Telephone Number*
Mary Aycock	(415) 972-3289 or (415) 271-1253(cell)
Nicole Moutoux	(415) 972-3012

Craig Cooper	(415) 947-4148
Gregg Dempsey	(702) 784-8232 or (702) 494-7040(cell)

EPA's onsite representative is Mary Aycock and EPA's alternate onsite representative is Roger Shura.

Boeing Points of Contact. Boeing has identified and provided in writing to the EPA Project Managers Boeing points of contact (POCs) (including the POC's name, telephone number, cell phone number, and email address) and alternate POCs in the following areas:

- Access to SSFL including through the front gate and other SSFL gates,
- Boeing badging process (both temporary day badges and longer-term Non-Boeing employee badges);
- SSFL facility operations (e.g., overall knowledge of Santa Susana facility structures (buildings, fences, roads), utilities, utility lines, access to water and power in EPA Study Area;
- Access to locked gates/fences, etc.;
- EPA work planning, scheduling and coordination with other activities at Santa Susana;
- Emergency medical response;
- Fire prevention planning;
- Fire prevention response;
- Spill prevention planning;
- Spill prevention response;
- Subsurface utilities locator/advisor;
- Health and Safety Orientation and related issues;
- Boeing environmental permits and compliance issues;
- Radio communications;
- Camera permits;
- Natural and cultural resources coordination;
- Groundwater monitoring wells; and
- Other topics as may be identified by EPA during the course of the EPA Work.

The Boeing and EPA Project Managers will each make best efforts to inform the other of any changes to the names or contact information for a Boeing or EPA POC.

Monthly Project Managers Meetings. Beginning in March 2010, Boeing's Project Manager will meet with one or more EPA Project Managers on a monthly basis to discuss the upcoming activities that EPA plans to conduct in the next thirty days. Other EPA, Boeing, Department of Energy (DOE) and California Department of Toxic Substance Control (DTSC) technical staff and contractors may be invited to this meeting. The schedule and location of these monthly meetings will be decided by Boeing and EPA project managers at the March meeting. These meetings may be conducted via conference call if necessary. The purpose of the monthly meetings include identification

and discussion of all EPA staff, contractors and subcontractors that will be on-site (i.e. within the SSFL boundaries), type and locations of EPA Work planned onsite, discussion of any permitting or regulatory requirements that may impact either EPA or Boeing, any Boeing requests to observe or take split samples of EPA samples (although Boeing reserves the right to observe sampling at any time), identification of additional persons who may require access to the site during this period, site health and safety orientation schedules, availability of Boeing POCs during this period, need for issuance of Boeing badges, discussion of any unique hazards that are or may be present in areas of the site where EPA Work may be conducted during the period and any other issues identified by EPA or Boeing. A meeting summary and action items with deadlines will be issued by EPA via email within 48 hours of each monthly meeting for review and comment.

Weekly Work Coordination Meetings. Starting the week of March 8 and weekly thereafter, every Friday or Monday morning, the Boeing Project Manager and EPA Project Managers and/or EPA's Onsite Representative(s) will discuss and coordinate the logistics concerning the EPA Work for the upcoming week, including any changes to the information discussed in the monthly meeting or any new issues that have been identified. Other EPA, Boeing, Department of Energy (DOE) and California Department of Toxic Substance Control (DTSC) technical staff and contractors may be invited to this meeting. A meeting summary and action items with deadlines will be issued by EPA via email within 24 hours of each Weekly Meeting for review and comment. Understandings reached between Boeing and EPA in these discussions will be documented in writing. A weekly meeting may be cancelled with the consent of both Boeing and EPA.

Boeing will also cooperate with EPA to provide, upon request from an EPA Project Manager or the EPA on-site representative, additional support for the EPA Work, including without limitation:

- providing access to water (e.g. spigots, water hydrants);
- providing GPS coordinates of the boundaries of the Santa Susana facility, the boundaries of the EPA Study Area, or other geographic boundaries within the site;
- enabling EPA to install "daisy chain" locks on gates into the northern undeveloped land and into Area IV;
- assistance facilitating and expediting entry of EPA, contractors and subcontractors in and out of the Santa Susana front gate;
- providing information on all hazards or obstructions known to Boeing in EPA work areas; and
- approval of camera permits, as necessary, for persons identified by EPA.

With respect to camera permits, EPA intends to keep the number of camera permits to a minimum necessary to achieve EPA Work objectives. EPA will be permitted to take all photographs in Area IV and the northern undeveloped land as necessary to support the EPA Work. However, if such photographs include any Boeing employees or include subjects outside of Area IV or the northern undeveloped land, EPA will consult with and obtain Boeing approval before making them publicly available or otherwise available to a non-US person.

Health and Safety

EPA and its contractor HGL will be responsible for requiring safe work practices of EPA employees, HGL employees, any other EPA contractors, and subcontractors performing the EPA Work at SSFL, including compliance with all appropriate and applicable regulatory requirements.

All EPA, HGL, and their respective contractor and subcontractor staff that will engage in the EPA Work will be provided the appropriate Santa Susana badge and site safety orientation. For all other persons, EPA or Escort Contractors who have received the Boeing Safety Orientation may provide a safety orientation to subcontractors or other third parties if Boeing staff is unavailable. EPA will provide Boeing with a Health and Safety Plan(s) (HASP) for EPA's workers, prime contractors, subcontractors, and members of the general public who visit/observe EPA Work. EPA will provide the HASP or HASPs to Boeing along with any additional contingency or emergency plan document prepared by EPA or its prime contractor for the EPA Work.

Environmental and Cultural

EPA, HGL, and their respective contractors and subcontractors will be responsible for compliance with any appropriate and applicable legal requirements related to the EPA Work as determined by EPA. EPA has consulted and will continue to consult with federal, local and state representatives, as well as Boeing representatives, on these matters. Boeing and EPA will coordinate so that the work does not cause non-compliance with any regulatory or permit requirements applicable to Boeing. EPA will cooperate with federal, state, and local government representatives, to address any potential compliance issues.

EPA, HGL, and their respective contractors and subcontractors shall take precautions in connection with the EPA Work hereunder including without limitation locating underground utilities prior to commencement of any drilling and, during adverse weather conditions, preventing its operations from becoming a significant source of surface water contamination. The EPA Work shall be performed in a reasonable manner designed to prevent disruption in or interference with any utility service for the Boeing property, as applicable. EPA, HGL and their respective contractors and subcontractors shall promptly repair or have repaired any damage to Boeing owned buildings and infrastructure (e.g., roads, utilities, and/or structures/systems).

Releases
EPA, HGL, and their respective contractors and subcontractors should not release onto the property or any neighboring property or into the air, surface water, soil, or groundwater any hazardous materials. If a release occurs, EPA, HGL, and their respective contractors and subcontractors, as applicable, will take responsibility for responding, containing, and cleaning the spill along with providing notification to

appropriate regulatory agencies. EPA will orally notify the Boeing Spill Prevention and Response POC of any spill or release of hazardous materials as soon as possible, followed by written email notification that will include all of the following information: 1) date, time and location of the spill or release, 2) material spilled or released, 3) estimate of the amount of spill or release, 4) a general description of the incident leading to the spill or release, 5) a description of any corrective actions taken, and 6) identification of any notifications made concerning the spill or release.

Waste Management

EPA, HGL, and their respective contractors and subcontractors shall be responsible for managing and disposing, in accordance with appropriate and applicable federal, state and local laws and regulations, any process water or waste water, soils or groundwater extracted, removed or generated during the performance of the EPA Work. EPA shall list itself as the generator of waste on both the waste manifest and any waste profile for use by the disposal facility for any waste materials generated at or removed from the Boeing property as a result of the EPA Work. Parties performing the EPA Work should not discharge process waters resulting from ongoing field operations to the ground. Any waste water generated must be collected and disposed of onsite at a location approved by the Boeing Project Manager or disposed of offsite at a location determined by EPA.

Environmental Permits

The EPA has begun and will continue to coordinate with appropriate and applicable regulatory agencies concerning the EPA Work. EPA's Project Managers will keep the Boeing Project Manager informed of EPA's discussions and coordination efforts with other regulatory agencies as part of the Weekly Work Coordination Meetings and will copy the Boeing Project Manager on associated correspondence with regulatory agencies.

Working During Rainy Season

EPA shall refrain from field work in Boeing NPDES surface water exclusion zones, identified by the Boeing Project Manager, during the rainy season, which is interpreted to be from October 1st through March 30th each year. However, the Boeing Project Manager and EPA Project Manager may mutually agree to limited field activities within the designated NPDES surface water exclusion zones on a location-by-location basis upon advance review and consultation.

Hazardous Materials Storage

EPA, HGL, and their respective contractors and subcontractors will inventory, store, and report as required to appropriate and applicable local regulatory agencies any hazardous material used on the facility. A list of all hazardous material brought onsite and used (including radioactive calibration sources) shall also be provided to Boeing in advance of bringing such material onsite. All hazardous materials brought onsite by EPA representatives shall be removed from the site within 60 days of completion of the EPA Work.

Biological Considerations
The EPA will coordinate and consult with appropriate and applicable federal and state agencies on potential biological impacts related to EPA's field activities. EPA will provide Boeing with an opportunity to review and comment on potential avoidance, minimization, or mitigation measures proposed by the EPA as a result of consultation with the involved regulatory agencies. EPA will be responsible for avoidance, minimization, or mitigation measures and subsequent follow-up mitigation monitoring reports that may be required by any Biological Opinion rendered by the U.S. Fish and Wildlife Service (USFWS) associated with the EPA Work. All plant cuttings resulting from vegetation removal efforts will be managed according to EPA's workplans that involve plant cuttings and the USFWS Biological Opinion associated with the EPA Work.

Cultural Considerations
EPA will provide Boeing with advance notice of and seek Boeing review and comment on any agreements or arrangements with any non-federally recognized Native American groups prior to conducting additional surveys or using Native American monitors as part of EPA Work. EPA, HGL, and their respective contractors and subcontractors will not release the location of any areas known or thought to be culturally significant to any outside group that does not have legal standing to obtain such information. EPA will notify the Boeing Cultural Resources POC of any cultural artifacts located as part of the EPA Work and agrees not to remove such artifacts.

Use of Pack Animals
EPA, HGL and their respective contractors and subcontractors, as appropriate, shall be responsible for the safe keeping and care of any pack animals (e.g., mules and horses) used while onsite. Stalls will be appropriately managed and any manure deposited on the ground either in the field or as a result of stabling shall be collected and disposed of offsite. Due to the possible impacts on the site NPDES permit, wash water from any stall cleaning must be contained and prevented from entering a Santa Susana storm drain system.

Movement of poisonous snakes

Various poisonous snakes exist on the site. EPA and its contractors and subcontractors will train and equip their staff on removal of snakes from the work area, and in as much as possible, not harm them. Snakes may be relocated out of the work area when necessary.

Site Entrance/Egress

EPA, HGL, and their respective contractors and subcontractors will enter and exit from the SSFL Main Gate at the beginning and end of the work day. However, other roads and site gates that lead to/from site may be used on a periodic basis, with advance EPA notice to the Boeing Project Manager, to facilitate the EPA Work. Because EPA study area boundaries consist of all land within Area IV and northern undeveloped land and because

EPA onsite field office will be located outside Area IV and the northern undeveloped land, Boeing will allow EPA, HGL, and their respective contractors and subcontractors to cross through Areas I, II, and III on primary paved roads. Boeing will also allow EPA to use and improve a dirt road that connects EPA's onsite field office in Area II with Area IV by crossing a section of Area III. EPA's methodology for improvements (e.g., placement of gravel) to this road will be communicated to Boeing via our Weekly Work Coordination Meetings.

While conducting EPA Work on-site (other than solely working at the EPA field office), one member of the EPA team will have a two-way radio (or similar) in order to communicate with Boeing facility personnel or SSFL site security if needed.

Access by Other Persons

Boeing will allow members of the public identified by EPA Project Managers access to the Area IV and the northern undeveloped land, provided a Boeing representative is present. If requested by EPA, the Boeing representative will travel in a separate vehicle and maintain an appropriate distance in order provide EPA and its guests privacy. EPA will provide the name of each person of the general public coming onsite to the Boeing Project Manager. Boeing and EPA team members will maintain visual contact of pubic visitors at all times while within SSFL boundaries, except that EPA will have the ability to meet with visitors in private and without a Boeing representative present at EPA's onsite field office.

EPA will provide a safety orientation to members of the public. Boeing may elect to provide a site safety orientation if it can be provided expeditiously upon the arrival of the public visitors. EPA understands that Boeing may decide to require that all public visitors must execute a waiver and release of liability prior to touring Boeing property. Boeing shall provide EPA with a copy of any waiver and release form that Boeing plans to use in advance of asking members of the public to sign such form.

For emergency response reasons, EPA will keep an updated daily log of all individuals who enter and exit SSFL associated with the EPA Work. EPA will provide a daily log for the past week at the Weekly Meetings.

Groundwater Monitoring Wells

Boeing will provide EPA, EPA contractors, and EPA subcontractors access to all groundwater monitoring wells and associated pumps/facilities (including electricity to run such facilities) owned by Boeing located within or outside SSFL and allow EPA to take samples from such wells and/or take split samples during Boeing well sampling events. An EPA Project Manager and the Boeing POC for groundwater wells will cooperate and coordinate EPA access to Boeing's wells, including coordinating EPA groundwater sampling events with Boeing's scheduled sampling events to the extent practicable. In the event that EPA takes split samples during a Boeing well sampling event, Boeing is responsible for the investigation derived waste associated with this

sampling activity. However, should EPA conduct its own groundwater sampling event, EPA will be responsible for the investigation derived waste associated with that sampling activity. Boeing will identify any known unique hazards that are or may be present in water to be extracted from any well owned by Boeing.

Property Condition

Boeing makes no warranty of any kind to EPA, EPA contractors or EPA subcontractors concerning the real property owned by Boeing at SSFL, its condition, or fitness for the EPA Work. EPA and its contractors, subcontractors and representatives will access the real property owned by Boeing at SSFL in its "as-is" condition.

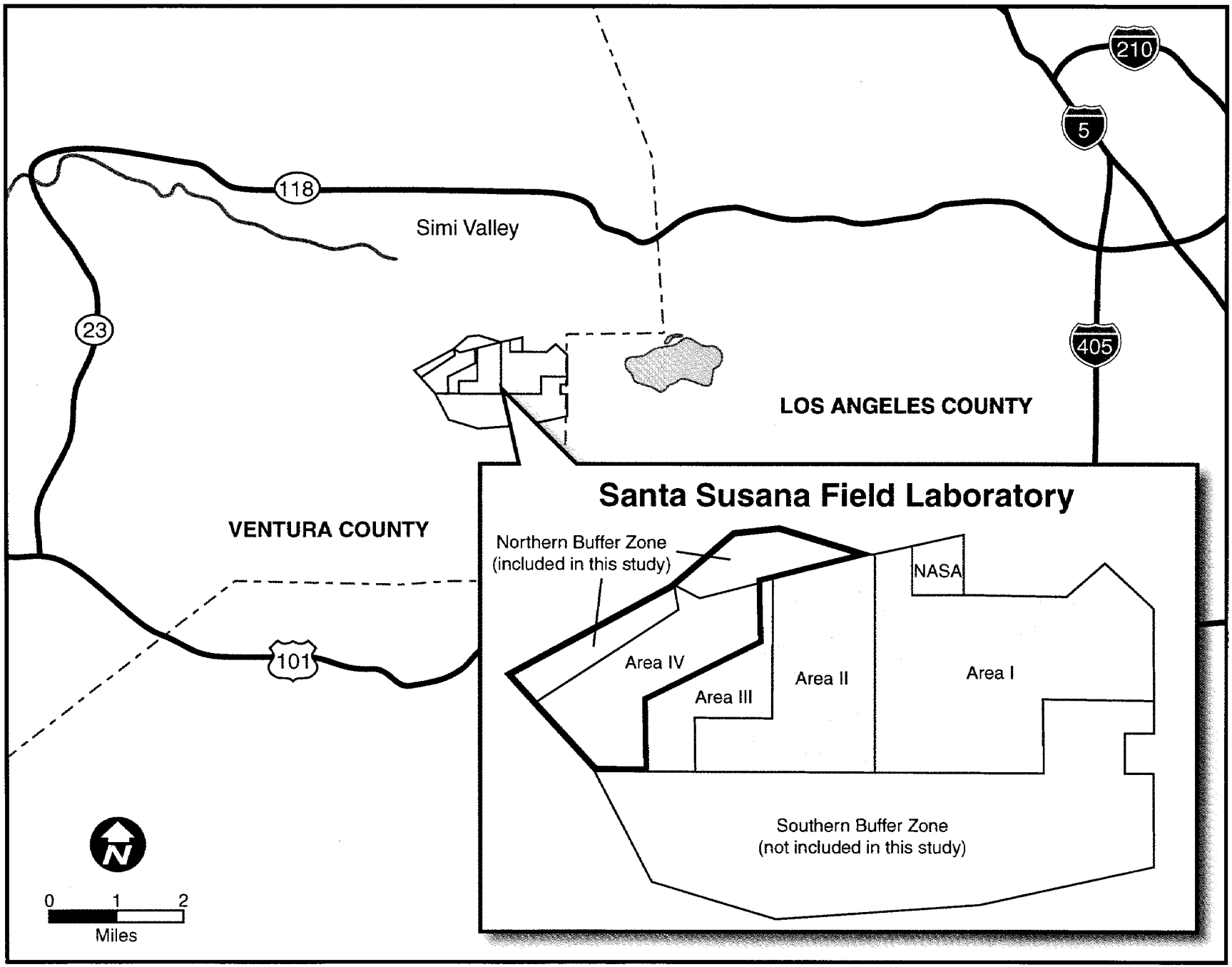

Figure 1: Santa Susana Field Laboratory,
Study Area Boundary for EPA's Radiological Study

APPENDIX C

RADIOLOGICAL SURVEY OF ON-SITE OFFICE FACILITY REVISION 1, AUGUST 2010

(Supersedes Revision 0 Submitted April 2010)

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The Palladino Company, Inc.
720 Fillmore Street
San Francisco, California 94117-2613
(415) 336-1556

May 5, 2010 Ref: 09-004

Eric Evans
HydroGeoLogic, Inc.
313 Ushers Road
Ballston Lake, NY 12019

Subject: SSFL Building 204 Scoping Survey Results

Dear Mr. Evans:

On October 28, 2009, Mr. Carl Palladino, a radiological specialist with The Palladino Company, Inc. (TPC) assisted Mr. Roger Shura, the United States Environmental Protection Agency (EPA) Santa Susana Field Laboratory (SSFL) Area IV Radiological Study field representative with conducting a scoping survey of Building 204 located in Area II on the SSFL, Ventura County, California. The purpose of the scoping survey was to determine if the interior of the building had evidence of surface contamination or warranted a characterization investigation. The scoping survey consisted of performing scanning surveys, performing static measurements, and collecting swipe samples for field screening analysis at random and biased locations throughout the building's interior.

A summary of instrumentation used during the scoping survey is provided in Table 1 with calibration forms attached. Each instrument was functionally checked for quality control purposes with either a radioactive thorium lantern mantle or a plutonium-239 filter check source, serial number C4-025, to document the detector response. Table 2 summarizes the results of the functional quality control checks.

Table 1: Summary of Instrumentation

Instrument	Instrument Type	Serial Number	EPA Identification Number
Ludlum Model 2221	Ratemeter/Scaler	196066	406
Bicron Model 3M3/3	3-inch by 3-inch sodium iodide scintillator	PR206008	406
Ludlum Model 2360	Ratemeter/Scaler	193695	373
Ludlum Model 43-93	Alpha scintillator	PR204917	373
Ludlum Model 19	Micro R Meter	233410	548
Ludlum Model 12	Ratemeter/Scaler	199622	385
Eberline HP260	Geiger-Mueller Pancake	102	385
Ludlum Model 2929	Alpha/Beta Counter	131371	193
Ludlum Model 43-10-1	Alpha/Beta scintillator	PR136256	193

Table 2: Summary of Functional Quality Control Check

EPA Identification Number	Background	Source	Radioactive Check Source
406 (window in)	10,130 cpm	50,236 cpm	Thorium
373	1 cpm	5,889 cpm	Thorium
548	10 µR/hr	40 µR/hr	Thorium
385	37 cpm	20,947 cpm	Thorium
193	0 cpm alpha	13,930 cpm alpha	Pu-239
	81 cpm beta	28,903 cpm beta	

Key:
cpm counts per minutes
µR/hr microRoentgen per hour
Pu-239 plutonium-239

The exterior perimeter of the building was first surveyed for gamma radiation with instruments 406 and 548. The average measurement for instrument 406 was approximately 16,000 cpm with an approximate range of 10,000 to 17,000 cpm. The average measurement for instrument 548 was approximately 13 µR/hr with an approximate range of 10 to 17 µR/hr. These measurements appeared to represented background values with no apparent anomalies.

For the interior of the building, approximately 100 percent of accessible floor areas were scanned with instrument 406 for gamma radiation. The instrument was elevated 6-inches above the floor and moved in a serpentine motion at approximately two feet per second. Random and biased locations on horizontal and vertical surface were scanned for alpha radiation with instrument 373 with scan speeds of one to two inches per second. The instrument was held for brief count times (less than 30 seconds) to collect a static measurement at biased locations which visually appeared to have accumulated particulate. Eleven swipe samples were collected from biased and suspected surface contamination locations. The swipes were Whatman number 41 paper filters, which were applied to the surface using moderate pressure over an approximately 100 centimeter square area.

No measurements with either instrument 406 for gamma radiation or instrument 373 for alpha radiation exceeded twice background. Swipe samples were field screened with instrument 193 for alpha and beta radiation; Table 3 summarized the swipe sample results.

Table 3: Swipe Sample Field Screening Results

Sample Number	Location	Beta (cpm)	Alpha (cpm)
1	Workshop floor	81	0
2	Entry door handle	84	0
3	Computer room outlet on west wall	89	3
4	Shelf in Room 58	83	0
5	Men's bathroom wall	82	0
6	Women's bathroom shelf	77	0

Sample Number	Location	Beta (cpm)	Alpha (cpm)
7	Equipment bay metal floor	88	0
8	Kitchen counter	87	1
9	Storage area door handle	75	1
10	Door jam	95	0
11	Office wall	89	0
3 (duplicate)	Computer room outlet on west wall	83	0

Key:
cpm counts per minute

Swipe sample field screening results were within the expected range compared to background.

Based on the results of this scoping survey, fixed and removable surface contamination was not evident inside Building 204 and additional surveys are not recommended at this time. If future measurements collected inside the building exceed the values obtained in this survey, then reconsideration for a more extensive characterization investigation may be warranted.

Please contact me with any questions.

Sincerely,

Carl Palladino
Radiation Specialist

Enclosure: Instrument Calibration Certificates

Designer and Manufacturer of Scientific and Industrial Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CERTIFICATE OF CALIBRATION

#193

CUSTOMER US ENVIRONMENTAL PROTECTION AGENCY ORDER NO. 20132849/337414

Mfg. Ludlum Measurements, Inc. Model 2929 Serial No. 131371

M Ludlum Measurements, Inc. Model 43-10-1 Serial No. PR136256

Cal. Date 28-Apr-09 Cal Due Date 28-Apr-10 Cal. Interval 1 Year Meterface 202-014

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 74 °F RH 48 % Alt 705.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Window Operation

☑ Audio ck.

☑ Meter Zeroed Alpha Sensitivity 175 mV Beta Sensitivity 4 mV Beta Window 50 mV

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set 825 V = 3.28 on High Voltage diol. High Voltage set with detector connected.

☑ HV Readout (2 points) Ref./Inst. 500 / 500 V Ref./Inst. 2000 / 2001 V

COMMENTS:

1 pi Eff. for Pu239≈25,200dpm s/n2928-01
Background:0cpm Reading:10,019cpm Eff.:39.75%

1 pi Eff. for SrY90≈55,115dpm s/n4016
Background:78cpm Reading:18,544cpm Eff.:33.50%

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Alpha Channel Digital Readout	400K cpm	40084 (0)	40084 101
	40K cpm	4008	4008
	4K cpm	401	401
	400 cpm	40	40
	40 cpm	4	4
Beta/Gamma Channel Digital Readout	400K cpm	40052 (0)	40052 (0)
	40K cpm	4008	4008
	4K cpm	400	400
	400 cpm	40	40
	40 cpm	4	4

Uncertainty within ± 10% . C.F. within ± 20%

dlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of her International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. e calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978. State of Texas Calibration License No. LO-1963

eference Instruments and/or Sources: ☐ S-394/1122 ☐ 1131 ☐ 781 ☐ 059 ☐ 280 ☐ 60646

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☒ ΔT E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Pu239 2928-01 ☑ Beta S/N Tc99 NI-EV C14 1131-51 ☐ Other

☑ m 500 S/N 63893 ☐ Oscilloscope S/N ☑ Multimeter S/N 93870637

Calibrated By: Jeramy Thompson Date 28-Apr-09

Reviewed By: Rhonda Hein Date 28 Apr 09

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

Designer and Manufacturer
of
Scientific and Industrial
Instruments

#193

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-10-1 Serial No. PR136256

Order #. 20132849/337414

Customer US ENVIRONMENTAL PROTECTION AGENCY

Alpha Input Sensitivity 175 mV

Counter 2929 Serial No. 131371

Beta Input Sensitivity 4 mV

Count Time 1Minute

Beta Window 50 mV

Other

Distance Source to Detector Tray

High Voltage	Background		Isotope Pu239 Size ≈25,200dpm		Isotope Tc99 Size ≈23,600dpm		Isotope C14 Size ≈247,201dpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
800	0	56	9999	758	2	P230	0	18312
*825	0	78	10019	351	2	8589	0	22434
850	0	81	9963	606	2	8580	0	26102

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Jeramy Thompson Date 28-Apr-09

Designer and Manufacturer of Scientific and Industrial Instruments

#406

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER US ENVIRONMENTAL PROTECTION AGENCY ORDER NO. 20132850/337415

Mfg. Ludlum Measurements, Inc. Model 2221 Serial No. 196066

M[illegible] Ludlum Measurements, Inc. Model S.T. ~~SM3/3~~ 44-20 Serial No. PR206008

Cal. Date 30-Apr-09 Cal Due Date 30-Apr-10 Cal. Interval 1 Year Meterface 202-159

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 74 °F RH 52 % Alt 700.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Background Subtract ☑ Input Sens. Linearity
☑ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geatrapism
☑ Audio ck. ☐ Alarm Setting ck. ☑ Batt. ck. (Min. Volt) 4.4 VDC

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set Comments V Input Sens. 10 mV Det. Oper. Comments V at 10 mV Threshold Dial Ratio 100 = 10 mV

☑ HV Readout (2 points) Ref./Inst. 500 / 506 V Ref./Inst. 2000 / 2020 V

COMMENTS:

	Peak settings	Gross Counts
High Voltage:	858 V	1150 V
Threshold:	642	100 (10mv)
Window:	40	n/a
Window Position:	"ON"	"OFF"
Resolution for Cs137:	≈9.34%	n/a

Calibrated with coiled cable.

Model 2200 currently set for gross counts.

Firmware: 261010

0.L checkid but not set.

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
x1K	400kcpm	400	400
x1K	100kcpm	100	100
x100	40kcpm	400	400
x100	10kcpm	100	100
x10	4kcpm	400	400
x10	1kcpm	100	100
x1	400cpm	200	400
x1	100cpm	100	100

*Uncertainty within ± 10% C.F. within ± 20% ALL Range(s) Calibrated Electronically

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400kcpm	39927 (0)	39927(0)
	40kcpm	40003	40003
	4kcpm	400	400
	400cpm	40	40
	40cpm	4	4

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Log Scale	500kcpm	500/1 cpm	500/1 cpm
	50kcpm	50/1	50/1
	5kcpm	5/1	5/1
	500cpm	500	500
	50cpm	50	50

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978 State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394/1122 ☐ 1131 ☐ 781 ☐ 059 ☐ 280 ☐ 60646
Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☐ Alpha S/N _____ ☐ Beto S/N _____ ☐ Other _____

☑ m 500 S/N 63893 ☐ Oscilloscope S/N _____ ☑ Multimeter S/N 93870637

Calibrated By: Jeremy Thompson Date 30-Apr-09

Reviewed By: Rhonda Hein Date 30 Apr 09

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22A 10/15/2008

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed: _____

Designer and Manufacturer
of
Scientific and Industrial
Instruments

#406

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector S.T. 44-20 ~~SM3/3~~ Serial No. PR206008

Customer US ENVIRONMENTAL PROTECTION AGENCY Order #. 20132850/337415

Counter 2221 Serial No. 196066 Counter Input Sensitivity 10 mV

Count Time 6 seconds Distance Source to Detector Surface

Other

High Voltage	Background	Isotope Am241 Size ~0.77 μCi	Isotope ____ Size ____	Isotope ____ Size ____	Isotope ____ Size ____
1050	2004	17901			
1100	2094	18506			
*1150	2049	18615			
1200	2028	18488			
1250	1944	18705			
1300	2131	18444			
1350	2256	18410			
1400	2438	18566			

Signature Jeramy Thompson Date 30-Apr-09

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION #373

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER US ENVIRONMENTAL PROTECTION AGENCY ORDER NO. 20132850/337415

Mfg. Ludlum Meosurements, Inc. Model 2360 Serial No. 193695

M Ludlum Meosurements, Inc. Model 43-93 Serial No. PR204917

Cal. Date 29-Apr-09 Cal Due Date 29-Apr-10 Cal. Interval 1 Year Meterface 202-855

Check mark ☑ applies to applicoble instr. ond/or detector IAW mfg. spec. T. 74 °F RH 52 % Alt 700.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Taler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Meter Zeroed ☐ Backgraund Subtract ☐ Input Sens. Linearity
☐ F/S Resp. ck ☑ Reset ck. ☑ Window Operation ☑ Geotropism
☑ Audio ck. ☑ Alarm Setting ck. ☑ Bott. ck. (Min. Volt) 2.2 VDC ☐ RS-232 Port OK
☑ Calibrated in accordonce with LMI SOP 14.8 rev 12/05/89. ☐ Colibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set 850 V

☑ HV Readout (2 points) Ref./Inst. 500 / 500 V Ref./Inst. 2000 / 2000 V

Firmware Version: 39010.24
Alpha Threshold: 120 mV
Beta Threshold: 3.5 mV
Beta Window: 40 mV
Overload set to simulate light leak
Instrument calibrated with a 39" cable.
High voltage set with detector disconected

(EEPROM Settings)
User Time: 1.0
Alpha Alarm: 999999
Beto Alarm: 999999
A/B Alarm: 999999
Model 2360 Date: 29-Apr-09
Calibration Date Due: 29-Apr-10

COMMENTS:

4 pi Eff. for Pu239≈25,200dpm s/n2928-01 Calibrated with coiled cable.
Background:0cpm Reading:5,684cpm Eff.:22.55%
4 pi Eff. for SrY90≈55,115dpm s/n4016
Background:175cpm Reading:14,289cpm Eff.:25.60%

Firmwar: 39010.24

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

RANGE/MULTIPLIER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
x1000	400k cpm	400	400
x1000	100k cpm	100	100
x100	40k cpm	400	400
x100	10k cpm	100	100
x10	4k cpm	400	400
x10	1k cpm	100	100
x1	400 cpm	400	400
x1	100 cpm	100	100

*Uncertainty within ± 10% C.F. within ± 20% ALL **Range(s) Calibrated Electronically**

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Digital Readout	400kcpm	39978 (0)	39978 (0)
	40kcpm	4001	4001
	4kcpm	400	400
	400cpm	40	40
	40cpm	4	4

	REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Log Scale			

Idlum Measurements, Inc. certifies that the obove instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of ther International Standards Organization members, or have been derived from accepted values of notural physical constants or have been derived by the ratio type of calibration techniques. ıe calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978 State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394/1122 ☐ 1131 ☐ 781 ☐ 059 ☐ 280 ☐ 60646
Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ; ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Pu239 2928-01 ☑ Beta S/N Tc99 NI-EV SrY90 4016 ☐ Other

☑ m 500 S/N 63893 ☐ Oscilloscope S/N ☑ Multimeter S/N 93870637

Calibrated By: Jeramy Thompson Date 29-Apr-09

Reviewed By: Rhonda Hein Date 30 Apr 09

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C22S 10/15/2008

AC Inst. Only ☐ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

Designer and Manufacturer
of
Scientific and Industrial
Instruments

#373

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-93 Serial No. PR204917

Customer US ENVIRONMENTAL PROTECTION AGENCY

Counter 2360 Serial No. 193695

Count Time 1Minute

Other

Order #. 20132850/337415

Alpha Input Sensitivity 120 mV

Beta Input Sensitivity 3.5 mV

Beta Window 40 mV

Distance Source to Detector Surface

High Voltage	Background		Isotope Pu 239 Size ≈25,200dpm		Isotope Tc 99 Size ≈22,600dpm		Isotope Sr 90 Size ≈55,155dpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
825	0	142	5400	551	3	3922	4	11684
* 850	0	175	5684	683	1	4891	5	14289
875	2	255	5599	853	0	5742	1	15604

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" coble and alpha/beta counter.

Signature Jeremy Thompson Date 29-Apr-09

#373

Model 2360 Log Data Date: 04/29/2009 Time: 01:53:28 PM Page: 1

Header 1: 0oÿ Q Public
Header 2: Serial#193695

Header 3: DetSer#PR204917
Header 4: Site:Building 1
Header 5: Room 7 EastWall
Header 6: More Comments?
Location: Table 007

Calibration Due Date: 04/29/2010
Model 2360 Date: 04/29/2009
Model 2360 Time: 02:53:01 PM

Logged Samples: 0

User PC Scaler Count Time: 1.0 minutes

Alpha Ratemeter Alarm Setpoint:	999999
Beta Ratemeter Alarm Setpoint:	999999
Alpha + Beta Ratemeter Alarm Setpoint:	999999
Alpha Scaler Alarm Setpoint:	999999
Beta Scaler Alarm Setpoint:	999999
Alpha + Beta Scaler Alarm Setpoint:	999999

CTI
Calibration Technology
A Division of RSCS, Inc.

Calibration Certificate
ID Number: 23341031077-0

#548

Customer: Roger Shura
US EPA
4220 S Maryland Parkway
Building C
Las Vegas, NV 89119

Instrument
Ludlum Model 19

Serial Number
233410

Precision Check

Test 1	Test 2	Test 3	Mean	Results
50.00 µR/hr	50.00 µR/hr	50.00 µR/hr	50.00 µR/hr	Satisfactory

Accuracy Check

Range	Target Value	As Found	As Left
5000	4 mR/Hr	4.1 mR/Hr	4.1 mR/Hr
5000	1 mR/Hr	1.0 mR/Hr	1.0 mR/Hr
500	400 µR/Hr	340 µR/Hr	400 µR/Hr
500	100 µR/Hr	90 µR/Hr #	100 µR/Hr #
250	200 µR/Hr	175 µR/Hr	200 µR/Hr
250	50 µR/Hr	45 µR/Hr #	50 µR/Hr #
50	40 µR/Hr	32 µR/Hr #	40 µR/Hr #
50	10 µR/Hr	8 µR/Hr #	10 µR/Hr #
25	20 µR/Hr	17 µR/Hr #	20 µR/Hr #
25	5 µR/Hr	4.5 µR/Hr #	5 µR/Hr #

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10.00% of Target value
Readings with # indicate ranges where pulser was used.

MTE Instrument Type	Model	CalDueDate
Pulser	Ludlum 500-4 SN: 66151	01/21/2010

Outer Physical Check: *Pass*
Internal Check: *Pass*
Geotropism Check: *Pass*
Mechanical Zero: *Pass*
Tap Test: *Pass*

Electronics Checks	As Found	As Left
High Voltage	626 Volts	626 Volts

Comments: All As Left readings taken subsequent to repair.

Calibrated by: _____ QA Review: _____ Calibration Date: 09/08/2009
Expires: 09/08/2010

Atmospheric Conditions - Temperature: 81°F Humidity: 31% Barometric Pressure: 30.04"hg
This calibration was performed by RSCS Inc. 91 Portsmouth ave, Stratham NH 03885 using a NIST Traceable radiation source (Cs-137 Beam Source SN: S-364), in conformance to the following standards: ANSI N323A (1997). RSCS New Hampshire Radioactive Material License Number: 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedure . This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc

APPENDIX D

DATA MANAGEMENT PLAN
REVISION 1, AUGUST 2010
(Supersedes Revision 0 Submitted March 2010)

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DATA MANAGEMENT PLAN

REVISION 1, AUGUST 2010

(Supersedes Revision 0 Submitted March 2010)

The data collection activities to be conducted at the Santa Susana Field Laboratory site will generate fixed laboratory data from the analysis of samples from multiple media; gamma radiation data integrated with Digital Global Positioning System (DGPS) data; Geographic Information System (GIS) data; geophysical data; field measurements; and other site-derived information. The resulting data will be entered into a single data management system for consistency in tracking samples; storing and retrieving data; evaluating analytical results; visualizing data in three dimensional and other views; and generating data tables and reports. This Data Management Plan was prepared to assist in implementing a successful data management strategy. The Data Management Plan is augmented by the requirements and procedures for field sample collection detailed in the Field Sampling Plan for Groundwater, Surface Water and Sediment; the Gamma Scanning Work Plan; the Geophysical Investigation Plan; and the Quality Assurance Project Plan (QAPP).

Objectives of this Data Management Plan

Successful data management results from coordinating data collection, control, storage, access, reduction, evaluation and reporting. This Data Management Plan documents the methodology that will be employed during project execution to link the various data management tools, including software packages, to assure that the various data and information types to be collected are systematically collected and managed. The specific objectives of this Data Management Plan are:

- Standardize and facilitate the collection, formatting, and transfer of project data into the data management system and components.
- Provide a structured data system that will support the end uses of the data, including planning, decision making and reporting.
- Minimize the uncertainties associated with the data, data-derived products, and interpretation of results through defined quality control (QC) measures and documented processes, assumptions and practices.
- Provide data that are adequately documented with descriptive information for technical defensibility and legal admissibility of the data.

Data Management Team Organization

A data management team has been established for the Santa Susana Field Laboratory site. The team will work together to properly execute the Data Management Plan and ensure that the project objectives and scope are realized. The team is composed of specialists in each related discipline and technical resource. The Project Manager is an integral part of the data

management team, and has overall responsibility for assuring the data are collected in accordance with the U.S. Environmental Protection Agency-approved Field Sampling Plan, Gamma Scanning Work Plan and QAPP. The members of the data management team are as follows:

- Project Manager
- Data Manager
- Field Team Leader
- Project Chemist
- Project Data Coordinator
- Database Administrator
- GIS Developer

The functional responsibilities of the data management team are described in below. One person may perform multiple roles depending on the level of data to be managed and analyzed.

Roles and Responsibilities of Data Management Team

The responsibilities of the members of the data management team are summarized below. Should the scope of the data require a division of labor, the PM in consultation with the data manager will determine assignments as appropriate to assure the best work flow.

Team Member	Roles and Responsibilities
Project Manager	• Responsible for preparing the work plan, schedule and milestones. • Coordinates efforts with the U.S. Environmental Protection Agency Project Team. • Determines the needs and objectives for tasks. • Assigns appropriate personnel to complete the project. • Ultimately responsible for the completion of the project.
Data Manager	• Coordinates, documents and reports on all data management activities. • Acts as a liaison between the data users and the data holders, making certain that data are provided to those who need it in the appropriate format. • Downloads and assembles the gamma scanning data daily, reviews the downloaded data for coverage, and notifies the field teams if there are gaps that will need to be rescanned. • Archives daily gamma scanning data.
Field Team Leader	• Responsible for the collection and documentation of all field generated data. • Conducts QC checks between the anticipated collection and actual collection of data and the accuracy of documentation submitted by the field teams.

Team Member	Roles and Responsibilities
Project Chemist	• Works with the subcontracts manager to develop the scope of work for laboratory subcontracts. • Assists in the definition of regulatory criteria and threshold values, and maintains the regulatory criteria in the database. • Provides assistance to the Project Manager and technical staff in interpreting analytical results. • Reviews validation of analytical data conducted by third-party reviewers.
Project Data Coordinator	• Responsible for tracking samples from collection through analysis to inclusion in the database through maintenance of a data tracking matrix. • Communicates with laboratories and data validators as needed. • Coordinates the QC process for validated data.
Database Administrator	• Has overall responsibility for the operation and maintenance of the project database • Ensures that the electronic data deliverable (EDD) provided by the subcontractor laboratory meets subcontract requirements. • Responsible for loading of data from the laboratory and field teams. • Responsible for the implementation and evaluation of standard operating procedures to ensure integrity of the database system.
GIS Developer	• Creates the GIS project including geographical features and area characteristics. • Incorporates analytic data through query functionality.

Site-Specific Database

A site-specific database will be used to store field data, laboratory data and other electronic data for the described work. The data platform that will be used for the storage is a Structured Query Language server. The Structured Query Language server will allow all of the data to be stored in a central location. An interface between the database and the end users will be developed so the necessary data can be queried. Data for users will be available in read-only form to prevent inadvertent changing of the data. Queries will be developed to produce tables to be incorporated into reports and presentations, and to support other data uses as needed. The data also will be made available for use in a GIS mapping system; this will allow data to be included on maps produced throughout the life of the project and in the development of the final report.

A Database Administrator or designee will be assigned to oversee the database and will be responsible for loading of data received from the laboratory and the field teams. The Database Administrator will ensure that only authorized personnel have access to the database and control any updates to the data. The Database Administrator will work with the laboratory to make sure that the data provided are in a format ready for upload into the database. Data will be transferred in an Excel, comma-separated value, or delimited-text file format depending on the electronic deliverable capabilities of the laboratory. QC is an important part of ensuring

that the data provided are correct. QC processes are discussed in greater detail the Quality Assurance Project Plan.

Data received from the laboratory will be processed prior to loading to determine if there are any gaps or errors in the required fields. After the data validation process is complete, the database will be updated with any changes to data qualifiers as a result of the data validation process. QC checks will be performed and are outlined in the QAPP to ensure that all appropriate qualifiers are applied and the Electronic Data Deliverable (EDD) content is complete and accurate.

Field Data and Forms

Site activities at Santa Susana Field Laboratory also will include the acquisition of non-analytical data. This includes logbooks, field sheets, photographic documentation, instrument calibration logs, visitor logs and, if required, survey activities. The Field Team Leader will be responsible for tracking the field data. Each field team and the Field Team Leader will have a logbook assigned to them to record daily activities. A Field Sampling Report will be filled out for all soil, groundwater, surface water, sediment, and seep samples collected. Groundwater samples also will have Groundwater Field Sampling Data Sheets and Monitor Well Static Water Level Forms completed. The Field Team Leader will review the field sheets on a daily basis to ensure that all necessary information has been included. Groundwater data including water levels and the final or stabilized parameters (pH, dissolved oxygen, conductivity, etc.) readings will be entered into a format compatible with the database. All hand-entered data will receive a 100 percent QC check before being loaded into the database.

Instruments requiring daily calibration will have Calibration Log Forms that will be completed every time calibration is conducted. Calibration logs also will be reviewed by the Field Team Leader and scanned after a page has been filled.

Based on the amount of photographic documentation required for the site, a logbook may be assigned specifically for recording all photographs taken. Otherwise, photographs will be documented in the logbooks assigned to the field team taking the photographs. When a photograph is taken, the following information should be documented: date and time, direction (north, south, southwest, etc.), person taking the photograph, description of what is shown, and, when possible, a common object such as ink pen or ruler should be placed in the frame for scale. Photographs will be downloaded to the file server. Photographs in Area IV and the northern undeveloped land are permitted per the access agreement with Boeing and the permits will be carried with each camera. Additionally, each individual taking a photograph must be listed on the permit. However, if Boeing employees or subjects outside the listed areas are photographed, approval from Boeing will be required before they are made publicly available or otherwise available to a non-U.S. person.

Gamma Scanning Data

Gamma scanning equipment will be used to identify gamma radiation anomalies in the Area IV study area. Different equipment will be used during the sampling activities based on terrain and vegetation constraints. Each gamma radiation detection system will be equipped with a DGPS. The gamma radiation measurement are integrated with the DGPS data and sent to a computer acquisition system. The system identifies the location of the data collection point and assigns coordinates to the gamma radiation measurement. All the data and posting plots of the area surveyed can then be produced from the detection system. The procedures to be followed for the gamma scanning data are outlined in the Gamma Scanning Data Management Procedure attached to this Data Management Plan.

Data Presentation

A Data Manager will be assigned and responsible for downloading and assembling the data each day. The Data Manager will review the downloaded to data for coverage and notify the field teams if there are gaps that will need to be rescanned. Data also will be reviewed for quality, and for the presence of unusual features. The gamma spectrum can have Regions of Interest identified that correspond with gamma emissions from isotopes of interest. The Data Manager will prepare data images and tracks showing color contours of the gamma radiation in each Regions of Interest identified by the radiation specialists on a daily basis. The Data Manager also will review data for high concentrations of gamma radiation outside of the Regions of Interest. These daily tracks and data images will be incorporated into the project GIS for inclusion into progress and final maps.

Data Analysis

After the preparation of data images and daily tracks, the gamma scanning data will be reviewed and the location of areas with elevated gamma radiation will be identified for further investigation. This review will be aided by the use of Noise Adjusted Singular Value Decomposition (NASVD). NASVD can be run in one of two modes. The first mode isolates naturally occurring gamma radiation from man-made gamma sources. The second mode requires that the user input the isotopes present where there are man-made gamma sources. The NASVD algorithm will then calculate a least squares fit for concentrations of each isotope based on the measured gamma spectrum. Location information and the potential presence of isotopes of concern along with inferred concentrations will be identified for flagged locations. This information will be incorporated in the project database and GIS.

Data Analysis Tools and Data Transfer

The Data Manager will use proprietary software provided by the gamma scanning equipment vendor, Radiation Solutions, Inc., to conduct all of the reviews, preparation of data images, and analysis described in the Data Presentation and Data Analysis sections. The commercially available geophysical processing package Geosoft Oasis Montaj also may be used to supplement the Radiation Solutions, Inc. software as needed. Data images will be exported in a geo-referenced .tiff raster image format for incorporation into the project GIS. Data tracks will be exported in a .shp vector/line format to conserve space when they are incorporated in

the project GIS. Flagged locations in the data will be exported in American Standard Code for Information Interchange (ASCII) or Microsoft Excel compatible formats, for incorporation into the project GIS and project database.

Geophysical Data

The purpose of the geophysical investigation is to survey, identify and locate areas of potential buried structures, features, or materials that may contain radiological contamination, such as process piping, drums, trenches and disposal areas. The presence of these items will be evaluated by conducting geophysical surveys over a 120-acre portion of the site where these features are most likely to be present. Data from the geophysical instruments and GPS will be collected continuously in data-loggers interfaced with the instruments. When the surveys are completed, the data will be downloaded into a computer. Terrain conductivity data from the EM31 MK2 will be pre-processed using Geonics DAT31MK2 software, and magnetometer data will be pre-processed using Geometrics Magmap software. Final data processing will be accomplished using Geosoft Oasis Montaj mapping software to produce color fill maps that identify anomalies of interest. These anomalies will be identified by abrupt changes in instrument response shown by colors that contrast with the background response. Final presentation maps will show the color fill geophysical data plots overlain on ArcGIS base maps, showing site features easily identifying the location and boundaries of survey coverage. The procedures to be followed for the gamma scanning data are outlined in the Gamma Scanning Data Management Procedure attached to this Data Management Plan.

Analytical Data

Samples collected by the field teams in accordance with the medium-specific Field Sampling Plans will be submitted to an off-site laboratory for analysis. The media to be sampled include soil, groundwater, surface water, sediment and seeps. Analysis and validation of all laboratory data will be done in accordance with the Santa Susana Field Laboratory QAPP, which includes the data quality objectives for the site. The Project Chemist developed the QAPP and is also available to provide assistance to the Project Manager and technical staff. The laboratory will be provided with a copy of the QAPP in order to review and implement the requirements. The procedures to be followed for processing the gamma scanning data are outlined in the Analytical Data Management Procedure attached to this Data Management Plan.

To ensure that sample results have been received, reviewed and accurately incorporated into the project database, the samples are tracked in two stages. The first stage covers the planning through data reporting stage and the second stage covers data validation through completion. A Project Data Coordinator will be assigned by the Project Manager to track the samples. Chain-of-custody forms will be reviewed by the Project Data Coordinator for correct sample identifications and analysis request.

Upon receipt of a sample shipment, the laboratory will provide the HGL Project Data Coordinator with a login sheet for all samples received and include, at a minimum, the sample

identification numbers, requested analyses, preservation, temperature and sample delivery group (SDG) number. The SDG number is how the samples are tracked for the remainder of the process. The Project Data Coordinator will review each login sheet and associated SDG information against the associated chain-of-custody forms to verify that all the correct information has been accurately transferred to the laboratory information management system and that the sample shipment was free from issues affecting analytical quality.

The Project Manager and Project Data Coordinator will be notified of any issues noted to determine whether analysis can continue or resampling is necessary. A data management tracking matrix will be created by the Project Data Coordinator to track milestones in the process. Those milestones include laboratory receipt, report and EDD received, validation assigned and completed, review of validation and EDD review. Due dates for each will be generated using the requirements of the laboratory Scope of Work and direction from the Project Manager.

Once the data have been analyzed and the report and EDDs received, the data is validated. Data validation is the process by which laboratory data are evaluated for data quality and usability. The specific data validation protocols and QC acceptance criteria are provided in the QAPP. Validation of data will be assigned to a validator that has the appropriate training and expertise using the required protocols and level of detail. The Project Data Coordinator will assign the validator(s) a data set by SDG and ensure that all necessary information is relayed. The validation report format will be approved by the Project Manager prior to the validation process; however, the final report will include a Data Qualification Table to address data qualifiers applied by the validator for QC discrepancies. Completed data validation reports will undergo a peer review by the Project Chemist to verify that the correct validation level and protocols were used; the laboratory supporting documentation was compared to the established acceptance criteria; the discussion of each QC element accurately and completely describes the issues associated with that element; the appropriateness of the qualification (or lack of qualification) was applied to the results; and verify agreement between the qualification described in the discussion and the qualification table.

After the data validation reports and the peer review are complete, the process of applying qualifiers to the database results and verifying the output of the project database begins. Qualifiers added, or removed, from the data points must be applied to the electronic version of the data. A spreadsheet is generated and each qualifier change is added. All corrections made to electronic files must undergo a QC review by a different individual from the one who performed the initial qualifier application. This is known as the 100 percent QC step. This process will be repeated until all qualifier modifications have been applied correctly to the spreadsheet. The final version of the electronic spreadsheet will be sent to the Database Administrator, or designee, and loaded into the database. Once the 100 percent QC data file has been uploaded, a 10 percent QC spreadsheet will be generated. This sheet is intended to be a check on the upload/download process into the database and as verification the data presented in the laboratory hardcopy and associated electronic file match. Every tenth line of the data in the spreadsheet will be compared to the hardcopy data. Any errors found will be corrected.

After all SDGs have undergone the QC process the database is ready to be queried to support project data reporting.

Data Archiving

The Data Manager will be responsible for archiving gamma scanning data on a daily basis, such that datasets are organized by individual team and day. Data will be archived in both a binary .rsv format and an ASCII format. The .rsv format contains both the gamma scanning data and additional information such as drift corrections applied to the data, as well as, digitized records of individual current pulses in the detector. It is readable using software proprietary to the equipment manufacturer, Radiation Solutions, Inc. It is expected that .rsv files typically will average 0.5 gigabytes per team, per day. The ASCII format data will contain the gamma scanning data in a 1024 channel histogram format. Because ASCII format records are universally readable, the archived ASCII data will comprise an always reviewable record for the gamma scanning survey. ASCII files are expected to typically average 40 megabytes per team, per day. Data will be archived on an external hard drive on a daily basis. Also, all gamma scanning data will burned to two Digital Video Disks (DVD) on a daily basis. One DVD will be kept on site; the second DVD will be stored at an off-site location. DVDs will be moved to the off-site location on a weekly basis.

Non-analytical field data that are generated also will be archived. Logbooks and field collection forms will be scanned on a weekly basis and saved on the local fileserver. Hardcopies of all forms will be stored in the project file at the HGL field office. Electronic copies of all non-analytical field data will be moved to an off-site location on a weekly basis. The Structured Query Language server database file and transaction logs will be backed-up on a daily basis.

The HGL field office fileserver will be backed-up in a redundant manner. The fileserver will have Redundant Array of Independent Disks storage allowing for single drive failure without loss of data. In addition, daily backups of the drive will be performed. At a minimum, the fileserver will be backed up on a local external hard drive and will include full and incremental backups. The backup scheme will allow the recovery of changes to file less than one week old.

Management of Geographic Information System Data

GIS data will be gathered throughout the life of the project to assist in visualization of current progress, to quickly pass spatial information to those engaging in field activities, and to provide visualization products to reports and presentations.

GIS data will be gathered from a variety of global positioning system (GPS) units using either subscriptions to Trimble Omnistar plans, which offer higher accuracy signals to the GPS receiver, or a Trimble RTK system which provides near survey grade accuracy. These levels of accuracy will be recorded along with the data points whenever the equipment allows. If needed the collected data will be post processed to further refine the accuracy of the data.

U.S. Environmental Protection Agency Metadata Editor or a similar tool will be used to create and edit geospatial metadata records that meet U.S. Environmental Protection Agency Geospatial Metadata Technical Specification and Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata requirements.

Spatial data from the Biological Assessment, Vegetation Trimming and Site Recon will be made available to gamma scanning teams as they prepare for each new scanning area alerting them to vegetation or animal species within their area as well as potential safety hazards. This data along with the results from the gamma scanning will serve for visualization for QC procedures, verification of completeness of field gathered data, and for preparing final reports and presentations.

ATTACHMENTS:

Attachment 1 - Analytical Data Management Procedure
Attachment 2 - Gamma Scanning Data Management Procedure
Attachment 3 - Quality Control of Manual Data Entry and Automated Processes

APPENDIX E

VEGETATION CUTTING PROTOCOL
REVISION 1, AUGUST 2010
(Supersedes Revision 0 Submitted March 2010)

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VEGETATION MANAGEMENT PROTOCOLS

REVISION 1, AUGUST 2010

(Supersedes Revision 0 Submitted March 2010)

Field activities associated with the U.S. Environmental Protection Agency's proposed action at the Santa Susana Field Laboratory site requires that vegetation within the study area be cut or trimmed to allow access for vehicles and equipment, and provide clearance for operation of gamma scanning equipment at optimum levels of sensitivity. It is recognized that there are many threatened, endangered, proposed, or sensitive species and critical habitats within the study area that must be protected to comply with statutory requirements.

This protocol summarizes some of the avoidance measures that will be taken. Additional details regarding protected species and specific requirements can be found in the Biological Assessment prepared by HydroGeoLogic, Inc. (HGL) and Envicom, Inc. and a Biological Opinion prepared by the U.S. Fish and Wildlife Service (USFWS) and in accordance with legal applicable Federal and State laws, local requirements and regulations and Executive Orders applicable for this site.

To ensure the protection of various species and compliance with biological regulations HGL has retained Envicom, Inc. to assist with species identification and vegetation cutting procedures. Envicom has experience working with native plant societies and other interested stakeholders (USFWS, California Native Plant Society, Santa Monica Mountains Conservancy, Mountains Recreation and Conservation Authority, Santa Susana Mountain Park Association, etc.) and will oversee the vegetation cutting activities.

Applicable Federal and State Laws, Local Regulations and Executive Orders

- Ventura County Air Pollution Control District Codes and Regulations - this code regulates fugitive dust that may be generated during vegetation cutting activities.
- Federal Endangered Species Act - this act regulates threatened and endangered species.
- California Endangered Species Act - this act generally parallels the Federal Endangered Species Act but is limited to subspecies native to California.
- California Fish and Game Codes and Regulations - provides authority to manage natural resources of California and regulates the taking of protected species.
- Ventura County Fire Protection District, State of California Codes and Regulations - these regulations indicate that vegetation cutting can generate sparks which is considered hot work; thus requiring a permit.

General

It will be necessary to trim or cut vegetation within the study area to a height of approximately 6 to 18 inches, where possible, to provide access for vehicles and equipment and allow

operation of gamma scanning equipment at optimum levels of sensitivity. Vegetation cutting will be conducted using a combination of mechanical equipment and hand tools.

All members of the field team will participate in an Envrionmental Education Training that will be administered by the project Biological Monitor. The training will inform field staff of the sensitive biological resources present and avoidance and minimization measures to be employed. Species-specific training will be administered to crews who will be performing activities within areas occupied, or presumed to be occupied, by listed species.

The following universal measures have been identified to avoid and minimize the effects associated with vegetation cutting activities:

- Within the two weeks prior to initiation of vegetation cutting activities, a qualified biologist will survey the Action area to delineate and flag the locations of individuals and habitat occupied by listed species or nesting migratory birds that will be avoided or protected from mechanical cutting and specific activities associated with the Action, i.e., the Electronic Route Guidance System or subsurface soil sampling.
- Cutting within these areas will be performed under the supervision of a qualified Biological Monitor pursuant to specific measures identified for each listed species below.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed, i.e., cutting will not involve grubbing.
- Limited pruning of mature oak trees may occur to allow access under the canopy; mature trees will not be felled. The Ventura County ordinance states that limbs of oak trees can be trimmed if they are less than 20 percent of the trunk diameter.
- Before entering natural habitat areas from off-site locations, vehicles and equipment will be properly cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, vehicles and equipment that have operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), will be cleaned before entering other natural habitat areas, and especially areas occupied by listed species.
- All vegetation cutting activities will have a fire extinguisher readily available in the immediate vicinity of the activity site during vegetation cutting activities.

Species-Specific Protocols

Certain types of vegetation will not be removed or trimmed, such as trees, sensitive or protected species, and vegetation that provides habitat for sensitive or protected species. These vegetation and animal species will be identified by a Biological Monitor, including but not limited to:

- Braunton's Milk-Vetch (Astragalus brauntonii) – endangered, critical habitat
- Lyon's Pentachaeta (Pentachaeta lyonii) – endangered

- Quino Checkerspot Butterfly (Euphydryas editha ssp. quino) – endangered
- California Red-Legged Frog (Rana aurora ssp. draytonii [Rana draytonii]) – threatened
- Coastal California Gnatcatcher (Polioptila californica ssp. californica) – threatened
- Conejo dudleya (Dudleya abramsii ssp. parva [Dudleya parva]) – threatened
- Marcescent dudleya (Dudleya cymosa ssp. marcescens) – threatened
- Santa Monica Mountains dudleya (Dudleya cymosa ssp. Ovatifolia [inclusive of
- Dudleya cymosa ssp. agourensis]) – threatened
- Spreading navarretia (Navarretia fossalis) – threatened
- California Orcutt Grass (*Orcuttia californica*) - endangered
- San Fernando Valley spineflower (Chorizanthe parryi var. fernandina) – candidate species
- Santa Susana Tarplant (Deinandra minthornii [Hemizonia m.]) – state-listed rare species

The listed species were obtained from the USFWS in a letter dated October 5, 2009, from Chris Dellith, to Craig Cooper of the U.S. Environmental Protection Agency Region 9 and updated in the Biological Opinion issued by USFWS in May 2010.

Braunton's milk-vetch

- A limited number of live outlier individuals may be cut where their removal would hinder access for scanning equipment into otherwise unoccupied habitat.
- Standing dead individuals may be allowed to be cut.
- Cut plants containing seeds including any senescent inflorescences will remain at their original location, or relocated to other suitable habitat for the species per the Biological Monitor.
- In occupied areas, brush cutting will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidances and minimization measures.
- Care will be taken not to damage or cause further mortality of standing live individuals during the brush cutting or when moving cut brush to temporary stockpiles.

Spreading Navarreti, California Orcutt grass, and vernal pool branchiopods

- Vernal pools or other California Orcutt grass or spreading navarretia habitat will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat.
- These measures also will protect habitat for vernal pool branchiopods. If significant negative effects result from the proposed changes, measures will be taken to divert flow to provide the necessary quantity of surface water to the habitat.

Coastal California Gnatcatcher

- Before activities commence within areas identified as potential habitat, a permitted biologist will conduct a survey of the potential habitat to determine the extent of suitable habitat present.
- If active nests are found, activities will postponed or halted in the area until an appropriate setback can be established, based on the judgment of the permitted biologist and in consultation with the USFWS.
- No project activities will occur within the setback area, until the nest is vacated, the juveniles have fledged, and there is no evidence of a second attempt at nesting, as will be determined by the permitted biologist.

California Red-Legged Frog

- Vegetation cutting activities within aquatic or riparian habitats, and upland habitats within 300 feet thereof, will be monitored by the Biological Monitor.
- Within these areas, only hand tools will be used for cutting vegetation.
- Aquatic habitats will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows, or the amount of sediment discharged to aquatic habitats.
- If significant negative effects result from the proposed changes, measures will be taken to divert flows to redirect the necessary quantity of surface water to the habitat.

Quino Checkerspot Butterfly

- Before brush cutting and mowing, the Biological Monitor, will survey the area to identify and flag primary host plants, or demarcate groups of primary host plants.
- Prior to cutting within areas occupied by host plants, a survey of habitat suitability will be conducted. If the habitat suitability survey concludes that the host plants within the area represent suitable habitat, the host plants will be preserved in their existing conditions until a protocol survey can be conducted to determine the presence and absence of Quino checkerspot.
- If Quino checkerspot are found to be present, the host plants will not be cut and USFWS will be consulted regarding the preservation of adult nectar sources in the proximity of primary host plants prior to vegetation cutting.
- Hand tools will be used with extreme care to cut vegetation in the vicinity of primary host plants or plants containing Quino checkerspot larvae.

Lyon's pentachaeta, spreading navarretia and San Fernando Valley spineflower

- Mowing and brush cutting in areas determined to support Lyon's pentachaeta, spreading navarretia, or San Fernando Valley spineflower will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by trained personnel.
- Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.

Dudleya species

- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species will be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.

Santa Susana Tarplant

- Vegetation cutting activities undertaken within or adjacent to areas occupied by Santa Susana tarplant will be performed with care by field-trained personnel under the supervision of the Biological Monitor so as not to damage or dislodge any of these plants.
- To further prevent impacts to individual plants, the Biological Monitor will flag Santa Susana tarplants in advance of vegetation cutting activities.

Mechanical Vegetation Cutting

Within the two weeks before initiation of vegetation cutting activities, the Biological Monitor will survey the study area to determine the locations of individual plants and habitat occupied by listed species or nesting migratory birds. Locations and plants that will be avoided or protected from mechanical cutting will be marked with flags. Mechanical cutting may include mowing or weed eaters.

No grubbing or disturbance of root systems will be allowed. All cut material will be collected in roll-off bins at or in proximity to the cutting location, and will later be chipped or shredded into mulch.

Vegetation Cutting Using Hand Tools

Cutting of vegetation in areas occupied by listed species or critical habitat will be limited to hand tools. The vegetation cutting will be conducted in a manner that does not cause irreparable damage to the vegetation and candidate species of plants and animals. Likewise, cutting activities will be performed such that their Critical Habitat Areas are not likely to be adversely affected. During cutting, reasonable care will be taken not to damage the soil structure supporting the plant's root systems. Unless otherwise specified, all cut material will be collected in roll-off bins at or in proximity to the cutting location, and will later be chipped or shredded into mulch.

Special precautions will be taken when removing or trimming poison oak to prevent exposure to workers. The use of herbicides to remove poison oak is prohibited.

Mulching

Native Vegetation

Native vegetation debris will be mulched and left in predefined localized areas to reduce the movement of native seeds and non-native plants to other areas. HGL will identify the location of mulching cells or areas where vegetation trimming will be placed. All stockpiled material will be covered to reduce the potential for windblown dust and redistribution of seeds.

Invasive Species

Mulching and returning of invasive species including poison oak cuttings to localized areas would significantly spread these non-native plants to otherwise undisturbed habitats. Poison oak and non-native invasive species trimmings will be separated and stored in a bin for off-site disposal. As specified in the Site Safety and Health Plan the appropriate precautions will be taken to prevent skin contact with poison oak. All field teams should be trained to recognize poison oak and to implement the appropriate protection measures. Refer to Figures 1 through 4 showing the varying seasonal phases of poison oak.

Figure 1 - Spring

Figure 3 - Fall

Figure 2 - Summer

Figure 4 - Winter

APPENDIX F

CULTURAL RESOURCES PROTECTION MEASURES REVISION 8, SEPTEMBER 2010

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CULTURAL RESOURCES PROTECTION MEASURES
SANTA SUSANNA FIELD LABORATORY
AREA IV AND THE NORTHERN UNDEVELOPED LANDS
REVISION 8, SEPTEMBER 2010

Field activities associated with the U.S. Environmental Protection Agency's (USEPA) proposed action at the Santa Susana Field Laboratory (SSFL) site that disturb the ground surface may potentially have an adverse effect on known and unknown cultural resources. Cultural resources include:

- archaeological deposits—soils that contain material evidence of human activity including the remains of houses, hearths, cemeteries, and other features,
- artifacts—objects made by people such as whole or broken grinding stones, bowls and tools of various kinds,
- rock paintings and carvings that are tied to the landscape, all of which provide information about the culture of the people who made and used them,
- cultural resources also include certain plants and sacred sites (natural features of the landscape that are recognized in local traditions and places with religious significance).

To mitigate the potential for disturbing cultural resources within Area IV of the SSFL, a records search was conducted to identify all archaeological sites that have been recorded through previous surveys. Field work has been designed so as to avoid all known and previously identified cultural resources. The measures that will be taken by USEPA to protect cultural resources during execution of the proposed action were derived from the draft Cultural Resources Management Plan prepared for the SSFL site by the National Aeronautics and Space Administration in February 2010; the draft Cultural Resources Clearance Survey prepared by the Department of Energy in November 2009; and from consultations held between USEPA, State Historic Preservation Office and Tribal Representatives on December 2 and 3, 2009. The Department of Energy conducted an additional survey within the Northern Undeveloped Lands of the SSFL in the Spring of 2010. The additional archaeological sites and cultural resources identified in this or subsequent surveys will be integrated into the Cultural Resources Protection Measures, which are outlined herein.

Applicable Federal and State Laws

The following regulations were evaluated for their potential applicability to EPA's proposed action:

- National Historic Preservation Act
- National Environmental Policy Act
- American Indian Religious Freedom Act
- Archaeological Resources Protection Act

Field protocols will be implemented to meet the substantive requirements of these regulations. No ground disturbing activity including vegetation clearing, mechanical gamma scanning, or soil sampling will be conducted within 50 feet of identified archaeological sites. Hand-held gamma scanning (non ground disturbing activity) will be allowed at identified archaeological sites if the Cultural Resource Monitor and Native American Advisor/Consultant are present. Field crew members will be trained to identify potential cultural objects, and will not disturb, remove, or collect any artifacts. A Cultural Resources Monitor and Native American Advisor/Consultant have been retained to monitor all ground disturbing activity and to provide archaeological monitoring support as necessary during the execution of the field work. If any previously unknown or unrecorded cultural resources are encountered or discovered through the field work, the Cultural Resources Monitor and Native American Advisor/Consultant will be notified and consulted immediately. The Cultural Resource Monitor operates under the supervision of the Cultural Resource Specialist, and has the authority to redirect work as necessary in order to evaluate and protect newly discovered cultural resources.

The Cultural Resources Monitor is a qualified archaeologist and specialist in southern California Native American artifacts and culture. As part of this work activity, the Cultural Resources Monitor will identify and flag all archaeological sites, areas, or artifacts, and oversee the execution of avoidance and protection measures as necessary throughout the field effort.

Field Protocols

Identification, avoidance, and protection measures will be taken during the execution of field activities at the SSFL site to protect Cultural Resources in accordance with all applicable laws, regulations, and policies as follows:

- HydroGeoLogic, Inc. (HGL) and subcontractor field personnel will receive training for identifying cultural features, archaeological sites, and artifacts. This training will be jointly conducted by the Cultural Resource Specialist and a local (Southern California) Tribal Representative before work begins.
- Cultural resources protection measures will be applied during all ground disturbing field activities. All known cultural resources, as identified through previous surveys, as well as all archeological sites and artifacts discovered through the course of this undertaking will be avoided. If potential artifacts are identified, the field crew will leave them in place and notify the Cultural Resources Monitor and Native American Advisor/Consultant immediately.
- A Cultural Resources Monitor and Native American Advisor/Consultant will be present to oversee all field work that:
    - May uncover or expose cultural resources (for example, vegetation cutting and removal).
    - Involves ground disturbance (such as mechanical gamma scanning and soil sampling).

- In the unforeseen event that a Native American Advisor/Consultant is temporarily unavailable for monitoring, a notification via email will be sent to Native American stakeholders requesting concurrence that the work can proceed during the interim. Based on comments received within 24 hours of such notification, a decision will be made to proceed in the absence of a Native American Advisor/Consultant if necessary.
- Previously undiscovered cultural resources that are encountered during any portion of the Undertaking shall be protected and avoided as noted above, and fully documented and recorded by the John Minch & Associates Cultural Resource Specialist. Site record forms for these sites will be submitted to the South Central Coastal Information Center (SCCIC) at California State University, Fullerton and thus be recorded in the California Historical Resources Information System (CHRIS) inventory. Upon request, site record forms will be provided to Native American groups that have confidentiality agreements with the SCCIC.
- In the event that temporally diagnostic artifacts or other isolated artifacts that are vulnerable to damage and/or unauthorized collection are encountered, the archaeological monitor shall obtain a global positioning system position of the artifact's exact location and then collect them. They will either be returned to their original locations after the project has concluded, or deposited in a public curation facility as appropriate. The ultimate disposition of artifacts will be determined in consultation with Native American representatives.
- Cultural materials that are found to be contaminated that are non-porous will be decontaminated to the levels considered safe for handling and storage.
- Cultural materials found to be contaminated but which cannot be decontaminated to levels considered safe due to their porosity, will be packaged and labeled with appropriate warnings.

In addition, the Cultural Resource Specialist will provide periodic oversight of the gamma scanning field activities. This level of monitoring is appropriate in order to oversee the implementation of the cultural resource avoidance and protection measures described herein, identify previously unrecorded archaeological sites or artifacts, and to ensure that previously unrecorded cultural resources are avoided and protected when encountered.

- The Cultural Resources Monitor and Native American Advisor/Consultant have the authority to redirect work if there are archaeological concerns associated with vegetation clearing, gamma scanning, and/or sampling activities.
- The Cultural Resources Specialist and Native American Advisor/Consultant will consult with EPA during the execution of field activities as necessary to protect cultural resources.

APPENDIX G

NATURAL RESOURCES PROTECTION MEASURES
REVISION 1, JUNE 2010
(Supersedes Revision 0 Submitted March 2010)

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PROTECTION OF NATURAL RESOURCES

REVISION 1, JUNE 2010

(Supersedes Revision 0 Submitted March 2010)

This document describes the protection measures that will be implemented during the execution of field activities at the Santa Susana Field Laboratory (SSFL) Site. An information sheet is provided for each listed species in the Biological Assessment prepared by the U.S. Environmental Protection Agency (USEPA) and the Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) and classified as listed below. Any additional species determined to be at risk from site activities will be included as necessary.

Braunton's milk-vetch (*Astragalus brauntonii*) **E (Endangered), CH (Critical Habitat)**
Lyon's pentachaeta (*Pentachaeta lyonii*) **E**
Spreading navarretia (*Navarretia fossalis*) **T (Threatened)**
California Orcutt Grass (*Orcuttia californica*) **E (Endangered)**
Conejo dudleya (*Dudleya abramsii* ssp. *parva* [=> *Dudleya parva*]) **T**
Santa Monica Mountains dudleya (*Dudleya cymosa* ssp. *ovatifolia* [inclusive of *Dudleya cymosa* ssp. *agourensis*]) **T**
Marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*) **T**
Coastal California gnatcatcher (*Polioptila californica* ssp. *californica*) **T**
Least Bell's vireo (*Vireo bellii* ssp. *pusillus*) **E**
California red-legged frog (*Rana aurora* ssp. *draytonii* [=> *Rana draytonii*]) **T**
Quino checkerspot butterfly (*Euphydryas editha* ssp. *quino*) **E**
Riverside fairy shrimp (*Streptocephalus woottonii*) **E**
Vernal pool fairy shrimp (*Branchinecta lynchi*) **T**
San Fernando Valley spineflower (*Chorizanthe paryii* var. *fernandina*) **C (Candidate)**
Santa Susana tarplant (*Deinandra minthornii*) **CR (California Rare)**

Acronyms and Definitions

ac	acres
ft	feet
ha	hectares
m	meter
spp	species

Candidate (C)—Candidate species are plants and animals for which the USFWS has sufficient information regarding their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. http://www.fws.gov/endangered/factsheets/candidate_species.pdf

Critical Habitat (CH)—Specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection. They may also be specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/

Endangered (E)—An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. http://www.fws.gov/Endangered/wildlife.html

Primary Constituent Element—primary constituent elements are defined as features that are essential to the conservation of the species.

Rare—Rare species are those with very limited distribution. http://www.dfg.ca.gov/habcon/plant/

Threatened (T)—A threatened species is one that is likely to become endangered in the foreseeable future. http://www.fws.gov/Endangered/wildlife.html

General Requirements and Notification Procedures

- Within two weeks prior to initiating the components of the proposed Action within a specified area, a USFWS-approved biologist shall conduct a pre-construction survey of the area to determine the presence/absence of Federal and/or State listed biological species including California Species of Special Concern. Within areas occupied by Federal listed species, USEPA will implement the avoidance and minimization measures identified for each of the Federal listed species discussed in detail below. In the event that a State listed species or California Species of Special Concern is identified, USEPA will identify, and to the extent feasible, implement avoidance and minimization measures.
- Within three days of locating a dead or injured coastal California gnatcatcher, California red-legged frog, vernal pool fairy shrimp, or Riverside fairy shrimp, USEPA must notify the Ventura Fish and Wildlife Office by telephone (805) 644-1766) and in writing (2493 Portola Road, Suite B, Ventura, California 93003). The notification must include the date, time, location of the carcass, a photograph, cause of death or injury (if known), and any other pertinent information. Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. Should any injured listed species survive, the Service must be contacted regarding their final disposition. The remains of listed species must be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321).

BRAUNTON'S MILK-VETCH

Species: *Astragalus brauntonii*

Status: Endangered, Critical Habitat

Habitat: Associated with fire-dependent chaparral habitat dominated by chamise (*Adenostoma fasciculatum*) and yucca (*Yucca whipplei*). The species is primarily known to occur on outcrops and generally occurs along the tops of knolls ranging from 244-640 meter (m) (800-2,100 feet [ft]), and is apparently restricted to carbonate and calcareous soils. The only locations which are non-calcareous are down-wash sites into which seeds have drifted. At the Action Area, Biologists of SWCA conducted an assessment of Braunton's milk-vetch in Critical Habitat Unit 1d in June, 2006. They found that 76.4 percent of the occupied area was found on Gaviota Rocky Sandy Loam, 13.5 percent on Calleguas-Arnold Complex, and the remaining 10.1 percent was Los Osos Clay Loam and Zamora Loam. All of the communities in the Critical Habitat Unit 1d appear to have burned when the Topanga Fire swept through the area in October 2005. A substantial portion of the area within Critical Habitat Unit 1d was used in the past as a soil borrow pit. That area supports non-native grassland, and only a few plants (less than 10) occur therein.

***Range*:** Known from the San Gabriel Mountains near Monrovia, and an unvouchered record for Chino Hills. There are also records in Coal and Gypsum Canyons in the Santa Ana Mountains. Most records are from the core of the Santa Monica Mountains and Simi Hills.

***Critical Habitat*:** Critical Habitat has been designated in Unit 1, The Northern Simi Hills, Subunit 1d: This subunit consists of 27 hectares (ha) (68 acres [ac]) of private land owned by

Boeing and 1 ha (2 ac) of local agency lands (Santa Monica Mountains Conservancy). This subunit contains at least two of the primary constituent elements (2 and 3); whether it contains primary constituent element 1 is unknown. Several hundred plants were reported at this location after a fire in 2006.

***Primary Constituent Elements*:** The primary constituent elements for *Astragalus brauntonii* are: (1) calcium carbonate soils derived from marine sediment; (2) low proportion (less than 10 percent) of shrub cover directly around the plant; and (3) chaparral and coastal sage scrub communities characterized by periodic disturbances that stimulate seed germination (e.g., fire, flooding, erosion) and reduce vegetative cover.

***Threats*:** Urban development, fragmentation of habitat, reduction of necessary pollinators and their associated species, threats from fire suppression activities, and random, naturally occurring extinction due to disturbances in small population sizes. Browsing of the plants at SSFL by mule deer (*Odocoileus hemionus*) may be reducing the amount of seed produced there. Contrary to primary constituent element 2, shrub cover greater than 10 percent appears to offer some protection from browsing.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and/or equipment in the occupied area and Critical Habitat could cause mechanical injury to the plants;
- Physically accessing occupied habitat areas by hand crews and equipment may stimulate mechanical germination from the dormant seed bank;
- Spread of invasive weeds by Action-related vehicles and/or equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as March-August in the first year following a fall season fire event, and continuing for 3 to 5 years, declining with each successive year.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to demarcate the limits of areas occupied by Braunton's milk-vetch.

Any action-related activities to be undertaken within said areas shall adhere to the avoidance and minimization measures identified below.

- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- A limited number of live outlier individuals may be cut where their removal would facilitate access for scanning equipment into otherwise unoccupied habitat. Standing dead individuals will be allowed to be cut; however, the cut plants including any senescent inflorescences that may contain seeds will remain on site at their original location, or relocated to other suitable habitat, as determined by a USFWS-approved biologist.
- Brush cutting in occupied areas will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Braunton's milk-vetch, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Braunton's milk-vetch, its primary constituent elements and habitats. Surveys undertaken in, or adjacent to, occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the Braunton's milk-vetch, the monitor well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

LYON'S PENTACHAETA

Species: *Pentachaeta lyonii*

Status: Endangered

Habitat: Occupies coastal habitats mostly below 150 m (500 ft), and pocket grassland sites that are ecotonal (transitional) to shrublands, occurring in openings in chaparral, coastal sage, and along edges of roads and trails. Undisturbed natural habitat is characterized by a low proportion of total vegetative cover and exposed soils with a microbiotic crust, which partially reduces competition with other species. Rodents and harvester ant colonies also manage the density of associated vegetation by reducing competition.

Range**:** Known from historic records dated around 1900 to be found at San Pedro, Wilmington, Palos Verdes Peninsula, and Santa Catalina Island, but extirpated from those locations. All current records are from the Santa Monica Mountains, western terminus of the Simi Hills, and around the western edge of the Simi Hills to the western edge of the City of Simi Valley.

Critical Habitat**:** Critical Habitat has been designated in Unit 1: Simi Valley Unit; Unit 2: Montclef Ridge Unit; Unit 3: Thousand Oaks Unit; and Unit 4. Triunfo Canyon Unit; Unit 5: Mullholland Drive Unit; Unit 6: Cornell Road Unit, and; Unit 7: Malibu Lake Unit. None of these designated Units include SSFL.

Primary Constituent Elements**:** primary constituent elements for *Pentachaeta lyonii* are: (1) clay soils of volcanic origin; (2) exposed soils that exhibit a microbiotic crust which may inhibit invasion by other plant competitors; and (3) a mosaic of bare ground (greater than 10 percent) patches in an area with less than 60 percent cover.

Threats**:** Direct loss of habitat and influence of development in close proximity to existing populations (fuel modification); introduction of competitive weeds, changes in local hydrology, intensive gopher activity altering soil integrity, and alteration of habitat structure from nearby development.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants;

- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants;
- Spread of invasive weeds by action-related vehicles and equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species; February through August. This annual species is mostly senescent after August.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate areas exhibiting the primary constituent elements or suitable habitat for Lyon's pentachaeta. In these areas, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of year (March to June). Actions undertaken in occupied areas shall be delayed until the dry phase, after the plants have become senescent, typically by late August.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Brush cutting in areas determined to support Lyon's pentachaeta will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Lyon's pentachaeta, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the Lyon's pentachaeta, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

SPREADING NAVARRETIA

Species: *Navarretia fossalis*

Status: Threatened

Habitat: Spreading navarretia is primarily associated with vernal pools, alkali playas, and alkali sinks. It sometimes is found in ditches and other artificial depressions, which occur in degraded vernal pool habitat, at elevations between sea level and 1,295 m (0-4,250 ft).

***Range*:** This plant is found in widely disjunct and restricted populations from the Santa Clarita region of Los Angeles County, east to Riverside County, and south through San Diego County and Baja California, Mexico. Historical records indicate that *Navarretia fossalis* is also known from two occurrences near Creston, in San Luis Obispo County.

***Critical Habitat*:** In total, approximately 264 ha (652 ac) have been designated as critical habitat for spreading navarretia within Los Angeles 132 ha (326 ac) and San Diego 132 ha (326 ac) counties. Unit 1: Los Angeles Basin-Orange Management Area is located in northwestern Los Angeles County and consists of Sub-unit 1A Cruzan Mesa and Sub-unit 1B Plum Canyon. These units contain 119 ha (294 ac) of private land in total, and are the closest designated critical habitat to the SSFL. There is currently a proposal to revise the critical habitat designation for this species, which would reduce the quality of designated critical habitat for the species, which would reduce the designated area of the Cruzan Mesa sub-unit by 67 ha (165 ac).

***Primary Constituent Elements*:** (1) Vernal pool, alkali playa, or alkali sink habitats, at elevations between sea level and 1,300 m (0-4,250 ft), found on flat to gently sloping terrain; (2) soils with a clay component or an impermeable surface or subsurface layer known to support vernal pool habitat including, but not limited to Cieneba-Pismo-Caperton in Los Angeles County, Domino, Traver, and Willows in Riverside County and Huerhuero, Placentia, Olivenhain, Stockpen, and Redding in San Diego. Clay soils serve to inhibit rapid infiltration of rainwater. These soils also act as a buffer to moderate the water chemistry and rate of loss of water to evaporation. Clay soils of this nature are known to support vernal pool, alkali playa, and alkali sink habitats; and, (3) associated hydrology that provides water to fill the pools in the winter and spring months. A pool with functional hydrology includes a combination of surface and underground water flow, native upland vegetation, and intact soil

substrate. An inundated phase occurring in the winter and spring months followed by a dry phase in the summer and fall months is necessary to maintain these specialized habitats.

***Threats*:** Most of the historical habitat of the spreading navarretia has been eliminated by agriculture and urban development. The species was proposed for listing as threatened on December 15, 1994 after the USFWS determined that *Navarretia fossalis* was declining as a result of habitat destruction and fragmentation from agricultural development, pipeline construction, alteration of wetland hydrology by draining or channelization, off-road vehicle activity, cattle and sheep grazing, weed abatement, fire suppression practices, and competition from non-native plant species.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants although this threat is reduced by its small stature and occurrence with other low growing plant species;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable habitat.
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and/or equipment in the occupied area and Critical Habitat could cause mechanical injury to the plants;
- Spread of invasive weeds by Action-related vehicles and/or equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as January-July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and/or equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate areas exhibiting the primary constituent elements or suitable habitat for spreading navarretia. In these areas, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of year (March to June). Actions undertaken in occupied areas shall be delayed until the dry phase, after the plants have become senescent, typically by late June.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.

- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vernal pools or other spreading navarretia habitat will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat.
- Mowing and brush cutting in areas determined to support spreading navarretia will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures. Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the spreading navarretia, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the spreading navarretia, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

CALIFORNIA ORCUTT GRASS

Species: *Orcuttia californica*

Status: Endangered

Habitat: California Orcutt grass is primarily associated with vernal pools. It tends to grow in the deeper and wetter portions of the vernal pool basins, but does not show much growth until the basins become somewhat desiccated. Although water chemistry requirements are not well-known, California Orcutt grass often occurs with the Riverside fairy shrimp; therefore, the water quality requirements for these species are possibly similar.

Range**:** The current range of California Orcutt grass is from the Carlsberg vernal pool located in Moorpark in Ventura County, south to the vernal pools around San Quintin, Baja California, Mexico. It ranges in elevation between 50 and 2,050 ft (15 and 625 m)

Critical Habitat**:** No critical habitat has been designated.

Primary Constituent Elements**:** No primary constituent elements have been identified, see Habitat discussion above.

Threats**:** California Orcutt grass and its habitat are threatened by habitat destruction and fragmentation from urban and agricultural development, pipeline construction, alteration of hydrology and flood plain dynamics, excessive flooding, off road vehicle activity, trampling by cattle and sheep, weed abatement, fire suppression practices (including discing and plowing), competition from alien plant species as well as other vernal pool species, and deleterious effects resulting from habitat fragmentation and adjoining urban land uses such as sedimentation and unseasonal runoff.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants although this threat is reduced by its small stature and occurrence with other low growing plant species;

- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable habitat.
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and/or equipment in the occupied area could cause mechanical injury to the plants;
- Spread of invasive weeds by Action-related vehicles and/or equipment could transport invasive weeds from known infested locations elsewhere in the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as after the first heavy rainstorms in late fall through spring.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and/or equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate areas exhibiting suitable habitat for California Orcutt grass. In these areas, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of year (March to June). Actions undertaken in occupied areas shall be delayed until the dry phase, after the plants have become senescent, typically by late June.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vernal pools or other California Orcutt grass habitat will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat.
- Mowing and brush cutting in areas determined to support California Orcutt grass will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures. Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the California Orcutt grass and it's habitat. Scanning undertaken in or adjacent to occupied

areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and it's habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species and it's habitats.
- If a monitoring well is located within or adjacent to areas occupied by the California Orcutt grass, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, and it's habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, and its habitats.

CONEJO DUDLEYA

Species: *Dudleya abramsii* spp. *parva*

Status: Threatened

Habitat: Conejo dudleya has unique habitat preference compared to all but one of the other local dudleyas. Both *D. a.* species (ssp) *p.* and *D. blochmaniae* ssp. *b.* grow in shallow, rocky soils in grassland and coastal sage habitat. *Dudleya abramsii* ssp. *parva* is restricted to soils derived from Conejo volcanics, and usually grows at the base of small, scattered rock outcrops, at elevations between 60 and 450 m (196-1,476 ft).

***Range*:** All known occurrences of this subspecies are from the Santa Rosa Hills and Montclef Ridge (western terminus of the Simi Hills), and there are none from the Santa Monica Mountains, or Santa Susana Mountains. However, there is one anomalous record from Orange County, coastal plains and basins: south coastal plain region 8 kilometers (5 miles) southeast of Laguna Beach, sea bluffs.

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** Urban development, fire management and suppression, establishment of equestrian facilities on occupied habitat, recreational activities that uproot plants, and removal by plant collectors.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants. Conejo dudleya is intimately associated with rocks and mowing and brush cutting will not be requited on rock surfaces.

However, brush adjacent to the shaded faces which this species prefers will need to be cut, and accidental damage could occur;

- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of Action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, ation-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate any *Dudleya* species possibly attributable to the listed taxa. *Dudleya* species encountered shall be treated as if they are a listed taxon, unless they can be determined otherwise by a USFWS-approved biologist.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species shall be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Conejo dudleya and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.

- If a monitoring well is located within or adjacent to areas occupied by the conejo dudleya, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

SANTA MONICA MOUNTAINS DUDLEYA

Species: *Dudleya cymosa* spp. *ovatifolia* and spp. *agourensis*

Status: Threatened

Habitat: The typical form is situated on shaded slopes and canyon bottoms on sedimentary conglomerate rock. The "*agourensis*" form occurs on a band of late Pleistocene dissected gravels that supports a sparser grassland habitat than the surrounding vegetation on the north slope of Ladyface Mountain. It occurs at elevations between 50 and 500 m (165-1,640 ft).

***Range*:** All known occurrences of this subspecies are from the north-facing slopes of the Santa Monica Mountains near Westlake Village to Agoura Hills and in deep canyon bottoms along lower Malibu Creek and Topanga Creek in the Santa Monica Mountains. In the Santa Ana Mountains there are populations in Modjeska Canyon and Modjeska Peak. There are no records of this subspecies from the Santa Rosa Hills, Simi Hills, or Santa Susana Mountains.

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** Bulldozing on private land, commercial and residential development, roadside weed abatement in the City of Agoura Hills.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants. Santa Monica Mountains dudleya is intimately associated with rocks and mowing and brush cutting will not be requited on rock surfaces. However, brush adjacent to the shaded faces which this species prefers will need to be cut, and accidental damage could occur;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of action-related vehicles and/or equipment in the occupied area could cause mechanical injury to the plants.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate any *Dudleya* species possibly attributable to the listed taxa. *Dudleya* species encountered shall be treated as if they are a listed taxon, unless they can be determined otherwise by a USFWS-approved biologist.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species shall be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Santa Monica Mountains dudleya and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the listed species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

MARCESCENT DUDLEYA

Species: *Dudleya cymosa* spp. *marcescens*

Status: Threatened

Habitat: The microhabitat requirements of the plant and limited distribution of the plant's potential habitat limit the possibility that any additional large populations will be found. *Dudleya cymosa* ssp. *marcescens* typically occurs on the lower reaches of sheer volcanic rock surfaces and canyon walls adjacent to perennial streams in coastal live oak woodland often with California bay (*Umbellularia californica*). In most locations, the topographic relief has prevented deep soil formation; therefore, this dudleya may be the only flowering plant occurring in a microhabitat that is otherwise dominated by mosses, lichens, and ferns (*Pellaea andromedifolia*, and *Polypodium californicum*). It occurs at elevations between 150 and 500 m (492-1,640 ft).

***Range*:** All known occurrences of this subspecies are from the Santa Monica Mountains, and there are none from the Santa Rosa Hills, Simi Hills, or Santa Susana Mountains.

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** Recreational use, particularly rock-climbing, collection, fire, and clearing or modification of native landscape vegetation.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants. Santa Monica Mountain *Dudleya* is intimately associated with rocks, therefore, mowing and brush cutting will not be required on rock surfaces. However, brush adjacent to the shaded faces, which this species prefers, will need to be cut, and accidental damage could occur;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;

- Operation of action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct a survey to identify and demarcate any *Dudleya* species possibly attributable to the listed taxa. *Dudleya* species encountered shall be treated as if they are a listed taxon, unless they can be determined otherwise by a USFWS-approved biologist.
- Within the two week period before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by known or suspected listed *Dudleya* species shall be performed with care by field-trained personnel, so as not to damage or dislodge any of these plants.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the marcescent dudleya and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the marcescent dudleya, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

COASTAL CALIFORNIA GNATCATCHER

Species: *Polioptila californica* spp. *californica*

Status: Threatened

Habitat: Coastal California gnatcatchers are found exclusively in coastal sage scrub habitat. Coastal sage scrub is composed of low-growing, drought-deciduous, and succulent plant species such as coastal sagebrush, California buckwheat, prickly pear, cholla, and various species of sage.

***Range*:** Generally found at elevations below 914 m (3,000 ft), the gnatcatcher ranges from California's Ventura County south through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties, extending into Baja California, Mexico. The coastal California gnatcatcher is not known to occur at the SSFL site. The species was heard vocalizing at the north end of Las Virgenes Road in Los Angeles County, which is probably the closest known occurrence of the species to the project site. In Ventura County the gnatcatcher has been observed northwest of Highway 23 and Tierra Rejada Road in Moorpark, at Montclef Ridge between Santa Rosa Road and West Olsen Road, and 4 kilometers (2.5 miles) west of Santa Paula.

***Critical Habitat*:** Designated critical habitat includes coastal California gnatcatcher habitat throughout the species' range in the United States (i.e., Ventura, Los Angeles, Orange, San Bernardino, and San Diego Counties, California) in a variety of climatic zones and vegetation types to preserve the genetic and behavioral diversity that currently exists within the species. Unit 13 is the closest to the SSFL, and contains 23,365 ha (57,737 ac) of designated critical habitat on federal, state, local, and private lands in western Los Angeles County and Ventura County. Unit 13 is located along the southern and eastern slopes of the Santa Susana Mountains and a portion of the interior foothills of the San Gabriel Mountains.

***Primary Constituent Elements*:** (1) Dynamic and successional sage scrub habitats: Venturan coastal sage scrub, Diegan coastal sage scrub, Riversidean sage scrub, maritime succulent scrub, Riversidean alluvial fan scrub, southern coastal bluff scrub, and coastal sage-chaparral scrub in Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties that provide space for individual and population growth, normal behavior, breeding, reproduction, nesting, dispersal and foraging; and (2) non-sage scrub habitats such as chaparral, grassland, riparian areas, in proximity to sage scrub habitats as described for primary constituent element 1 above that provide space for dispersal, foraging, and nesting.

***Threats*:** Threats to the coastal California gnatcatcher include habitat loss, fragmentation, and degradation, urban and agricultural development, livestock grazing, invasive exotic grasses, off-road vehicles, pesticides, and military training activities.

Stressors: Mowing and brush cutting of understory riparian vegetation within riparian woodlands to a height of approximately six to 18 inches could result in disturbance or direct harm to nesting coastal California gnatcatchers, and could reduce the value of the habitat for cover and foraging.

***Period of Greatest Sensitivity to Proposed Action*:** During the breeding season for this species; February through August.

Protective Measures:

- Before action-related activities commence within areas identified as potential habitat for the coastal California gnatcatcher, a Section 10(a)(1)(A) permitted biologist will survey the potential habitat to determine the extent of suitable habitat present. For areas identified as suitable habitat, protocol surveys will be conducted between February 15 and August 30, according to Presence/Absence Survey Guidelines. If active nests are found, the USEPA must not conduct activities within 400 ft (122m) of the nest. No project activities will occur within the setback area until the nest is vacated and juveniles have fledged, and there is no evidence of a second attempt at nesting as determined by the Service-approved biologist.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the coastal California gnatcatcher, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and

habitats. Surveying undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitor well is located within or adjacent to areas occupied by the coastal California gnatcatcher, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the coastal California gnatcatcher, the monitoring well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

LEAST BELL'S VIREO

Species: *Vireo bellii* spp. *pusillus*

Status: Endangered

Habitat: A riparian species, Least Bell's Vireos depend on dense, low-growing thickets of willows, mulefat, mugwort, and California wild rose. Vireos inhabit areas where an overstory of taller willows, cottonwoods, and sycamores is also present. During the winter, they are known to occur in mesquite scrub vegetation. Foraging sometimes takes place in adjacent chaparral and coastal sage scrub.

***Range*:** The Least Bell's Vireo was once widespread with a summer range from northern California all the way to Baja California, Mexico, extending as far east as Death Valley. The Vireo can today be found in a handful of locations from Santa Barbara to San Diego counties. The Least Bell's Vireo is not known to occur at the SSFL site or the surrounding area. The species has been observed at several locations within Ventura County and a few locations in Los Angeles County. For example, the Least Bell's Vireo has been observed at the Santa Clara River and Arroyo Simi in Ventura County and at Hansen Dam in Los Angeles County.

***Critical Habitat*:** A total of about 14,569 ha (36,000 ac) is designated critical habitat for the Least Bell's Vireo at ten localities in portions of six counties in southern California. The nearest designated critical habitat to the SSFL is along the Santa Clara River generally between Piru and Castaic Junction within Ventura and Los Angeles Counties.

***Primary Constituent Elements*:** Riparian woodland vegetation that generally contains both canopy and shrub layers, and includes some associated upland habitats.

***Threats*:** The Least Bell's Vireo has suffered habitat loss due to urbanization, agricultural development, the damming and canalization of rivers and streams, invasion of non-native

plants, pesticides, road construction, and sand and gravel mining. Brood parasitism by the brown-headed cowbird is another serious threat.

Stressors: Mowing and brush cutting of understory riparian vegetation within riparian woodlands to a height of approximately six to 18 inches could result in disturbance or direct harm to nesting Least Bell's Vireos.

***Period of Greatest Sensitivity to Proposed Action*:** During the breeding season for this species; March through September.

Protective Measures:

- Action-related activities within areas identified as potential habitat will be conducted between October 1 and March 14.
- Before initiating action-related activities between March 15 and September 30 within areas identified as potential habitat, protocol surveys will be conducted by a permitted biologist to determine presence and absence of species. If present, the nature of their activities will be determined and USFWS will be consulted.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Least Bell's Vireo, their primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Least Bell's Vireo, its primary constituent elements and habitats. Surveying undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the Least Bell's Vireo, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the Least Bell's Vireo, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

CALIFORNIA RED-LEGGED FROG

Species: *Rana aurora* spp. *draytonii*

Status: Threatened

Habitat: This frog prefers aquatic habitat such as ponds, marshes and creeks with still water for breeding. It needs riparian and upland areas with dense vegetation and open areas for cover, aestivation food and basking. Frogs in cooler areas may hibernate in burrows for the winter.

Range**:** California red-legged frogs were once common throughout California's Central Valley, from Point Reyes National Seashore down to northwestern Baja California. Today they occupy Sonoma and Butte counties in the north to Riverside County in the south, mostly in the western counties. They reside in about 238 streams or drainages in 23 counties, with Monterey, San Luis Obispo, and Santa Barbara counties supporting the most frogs. They now exist in about 30 percent of their historic range.

Critical Habitat**:** The Service has recently reopened the comment period on the proposed revision of critical habitat, whereby they propose to revise designated critical habitat from the previous final rule designating 182,225 ha (450,288 ac) to approximately 730,403 ha (1,804,865 ac) in 28 California counties, an increase of approximately 548,178 ha (1,354,577 ac). The closest proposed Critical Habitat areas to SSFL are: VEN–1, San Antonio Creek; VEN–2, Piru Creek; VEN–3, Upper Las Virgenes Canyon, and; LOS–1, San Francisquito Creek.

Primary Constituent Elements**:** According to USFWS the primary constituent elements are: (1) *Aquatic Breeding Habitat*: standing bodies of fresh water, including: natural and manmade stock ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years. (2) *Non-Breeding Aquatic Habitat:* freshwater and wetted riparian habitats that may not hold water long enough for the subspecies to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period. (3) *Upland Habitat*. upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1.6 kilometers (1 mile) in most cases and comprised of various vegetation such as grasslands, woodlands, wetland, or riparian plant species that provides shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and

surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g., downed trees, logs), as well as small mammal burrows and moist leaf litter. (4) *Dispersal Habitat:* accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1.6 kilometer (1 mile) of each other and that allows for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (e.g., heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 20 ha (50 ac) in size, or other areas that do not contain those features identified in primary constituent element 1, 2, or 3 as essential to the conservation of the subspecies.

***Threats*:** Habitat loss to urban development, agriculture, logging and wetland draining, impacts of dams and water diversions, competition and predation by introduced species, pesticides, cattle grazing, and global warming are driving frog populations down.

Stressors:

- Operation of action-related vehicles and equipment, as well as foot traffic, within aquatic habitats or riparian habitats, or upland habitats within 300 feet thereof;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could potentially result in an indirect impact to the species by altering the quantity of water flowing to suitable aquatic or wetted habitats.

***Period of Greatest Sensitivity to Proposed Action*:** During breeding from November through April.

Protective Measures:

- Actions conducted within aquatic or riparian habitats, and upland habitats within 300 feet thereof, shall be supervised by a USFWS-approved biologist. Actions other than water sampling activities within intermittent aquatic habitats shall be conducted when the intermittent water body is dry.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- Vegetation cutting activities within aquatic or riparian habitats, and upland habitats within 300 feet thereof, will be monitored by a USFWS-approved biologist. Within these areas, only hand tools will be used for cutting vegetation.

- Aquatic habitats will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows, or the amount of sediment discharged to aquatic habitats. If significant negative effects result from the proposed changes, measures will be taken to divert flows to redirect the necessary quantity of surface water to the habitat.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the California red-legged frog, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- Gamma scanning surveys conducted within aquatic or riparian habitats and upland habitats within 300 feet thereof, shall be supervised by a USFWS-approved biologist. Gamma scanning surveys of intermittent aquatic habitats shall only be conducted when the intermittent water body is dry.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveying undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Geophysical surveys conducted within aquatic or riparian habitats and upland habitats within 300 feet thereof, shall be supervised by a USFWS-approved biologist. Geophysical surveys of intermittent aquatic habitats shall only be conducted when the intermittent water body is dry.
- Locations of soil sampling surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitoring well is located within or adjacent to areas occupied by the California red-legged frog, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the California red-legged frog, the monitoring well sampling crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If activities occur within aquatic habitat suitable to support red-legged frog, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force must be followed at all times as listed below. Items D, E, and F are listed in the unlikely event that the red-legged frog is encountered at the sampling point. If this occurs, specimens will be captured and relocated to suitable habitat.

A. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (boiled or treated) water before leaving each work site.

B. Boots, nets, traps, and other types of equipment used in the aquatic environment should then be scrubbed with 70 percent ethanol solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.

C. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or "base camp". Elsewhere, when washing-machine facilities are available, remove nets from poles and wash in a protective mesh laundry bag with bleach on the "delicates" cycle.

D. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean them as directed above and store separately at the end of each field day.

E. When amphibians are collected, ensure that animals from different sites are kept separately and take great care to avoid indirect contact (e.g., via handling, reuse of containers) between them or with other captive animals. Isolation from unsterilized plants or soils, which have been taken from other sites is also essential. Always use disinfected and disposable husbandry equipment.

F. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.

G. Used cleaning materials and fluids should be disposed of safely and, if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

QUINO CHECKERSPOT BUTTERFLY

Species: *Euphydryas editha* spp. *quino*

Status: Endangered

Habitat: The Quino checkerspot may occupy a variety of habitat types including grasslands, coastal sage scrub, chamise chaparral, red shank chaparral, juniper woodland, and semi-desert scrub that support native species of plantain, the butterfly's primary larval host plant. This checkerspot can also be found at the lower edge of the chaparral, in desert canyons, and in canyon washes.

***Range*:** Historically, this butterfly was distributed throughout the coastal slopes of southern California, from Los Angeles, Orange, Riverside, San Diego, and San Bernardino counties southward to El Rosario in northern Baja California, Mexico. Its historic distribution included the westernmost slopes of the Santa Monica Mountains, the Los Angeles plain, and the Transverse Ranges to the edge of the upper Anza-Borrego desert. The Quino checkerspot is not known to occur at the SSFL property. All current records for this species are within San Diego and Riverside County.

***Critical Habitat*:** Approximately 25,141 ha (62,125 ac) of critical habitat is designated for the Quino checkerspot butterfly within 9 units. All designated critical habitat is located in Riverside and San Diego counties.

***Primary Constituent Elements*:** (1) Open areas within scrublands at least 2 square m (21.5 square ft) in size that: (A) contain no woody canopy cover; and (B) contain one or more of the host plants *Plantago erecta, Plantago patagonica*, *Antirrhinum coulterianum*, or *Collinsia concolor* used for Quino checkerspot butterfly growth, reproduction, and feeding; or (C) contain one or more of the host plants *Cordylanthus rigidus* or *Castilleja exserta* that are within 100 m (328 ft) of the host plants listed in (B) above; or (D) contain flowering plants with a corolla tube less than or equal to 11 millimeters (0.43 inches) used for Quino checkerspot butterfly feeding; (2) open scrubland areas and vegetation within 200 m (656 ft) of the open canopy areas (primary constituent element 1) used for movement and basking; and (3) hilltops or ridges within scrublands that contain an open, woody-canopy area at least 2 square m (21.5 square ft) in size used for Quino checkerspot butterfly mating (hilltopping behavior) and are contiguous with (but not otherwise included in) open areas and natural vegetation described in primary constituent elements 1 and 2 above.

***Threats*:** The Quino checkerspot is threatened by elimination, fragmentation, and degradation of habitat caused by urban and suburban development, increased fire frequency, pesticide

spraying, unauthorized trash dumping, exotic plants, off-road vehicles, and collecting. On national forest lands the species is threatened by displacement of larval host plants and adult nectar sources, the spread of invasive plants, livestock grazing, predation by exotic invertebrates, off-road vehicle activity, and fire-management practices.

Stressors:

- Mowing and brush cutting of primary host plant species and adult nectar sources to a height of approximately six to 18 inches. Larval host plants include *Plantago erecta, Plantago patagonica, Antirrhinum coulterianum, Collinsia concolor, Cordylanthus rigidus* and *Castilleja exserta*. Adult nectar sources are flowing plants with a corolla tube less than or equal to 0.43 inches.
- Operation of action-related vehicles and equipment in occupied areas my cause direct mortality to all life stages of the species as well as to primary host plants.
- Operation of action-related vehicles and equipment could serve to transport invasive seeds to areas supporting host plant species. Invasive plant species may out-compete primary host plants, resulting in habitat loss and indirect impacts to the species.

***Period of Greatest Sensitivity to Proposed Action*:** During growth of the larval host plants, as well as the peak of adult egg-laying activity, estimated February through May.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall survey the Action Area to identify and flag primary host plants for Quino checkerspot butterfly. Action-related activities to be undertaken within said areas shall adhere to the avoidance and minimization measures identified below.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and/or habitat. Cutting will be performed under the supervision of the biologist.
- Before brush cutting and mowing, a USFWS-approved biologist shall survey the Action Area to identify and flag primary host plants for Quino checkerspot butterfly. Prior to cutting within areas occupied by host plants, a habitat suitability survey shall be conducted. If the host plants are concluded to represent suitable habitat, the host plants will be preserved in their existing condition until a protocol survey can be conducted to determine the presence and absence of Quino checkerspot. If present, the host plants will not be cut and USFWS will be consulted regarding the preservation of adult nectar sources prior to vegetation cutting. Hand tools will be used with extreme care to cut vegetation in the vicinity of primary host plants or plants containing Quino checkerspot larvae.

- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Quino checkerspot butterfly, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Quino checkerspot butterfly, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the Quino checkerspot, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the Quino checkerspot, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

RIVERSIDE FAIRY SHRIMP

Species: *Streptocephalus woottonii*

Status: Endangered

Habitat: The Riverside fairy shrimp is restricted to deep vernal pools and ponds with chemistry and temperature conditions specific to non-marine and non-riverine waters. The species has also been found in depressions that support suitable habitat, such as road ruts and ditches. The vernal pools that Riverside fairy shrimp are found in typically have water with a relatively neutral pH (approximately 7), low to moderate salinity, and low to moderate levels of total dissolved solids. Generally, in vernal pools where Riverside fairy shrimp occur, the external ion concentrations (Na+) averaged 0.73 mmol/l[3]. All known vernal pool habitat lies within annual grasslands, which may be interspersed with chaparral or coastal sage scrub vegetation. Vernal pools form when winter rains fall on relatively flat lands whose soils are underlain by naturally impervious layers, usually dense clay layers. Because the water can't easily percolate down into the ground, above ground pools form in the vernal months of late winter and early spring, evaporating in late spring. A suite of uniquely adapted plants and animals like the Riverside fairy shrimp depend on these seasonal pools for life.

***Range*:** Known from California's Ventura, Los Angeles, Riverside, Orange, and San Diego counties, the shrimp has also been found at two locations Valle de las Palmas and south of El Rosario in Baja California, Mexico.

***Critical Habitat*:** There is approximately 124 ha (306 ac) of designated critical habitat for the Riverside fairy shrimp within Ventura, Orange and San Diego counties. Of this area, 94 ha (232 ac) are within Ventura County. Designated critical habitat in Ventura County consists of two sub-units. Sub-unit 1A is in the City of Moorpark Greenbelt, north of Tierra Rejada valley, and contains the Carlsberg vernal pool. Sub-unit 1B is located on the east side of the 23 Freeway and south of Tierra Rejada Road.

***Primary Constituent Elements*:** Three main primary constituent elements have been identified for the Riverside fairy shrimp, with the first two considered to be the most significant: (1) small to large pools or pool complexes, with the appropriate size and volume, local climate, topography, water temperature, water chemistry, soil conditions, and length of time of inundation with water necessary for Riverside fairy shrimp incubation and reproduction, as well as dry periods necessary to provide the conditions to maintain a dormant and viable cyst bank; (2) geographic, topographic, and edaphic features that support aggregations or systems of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions

within a matrix of immediately surrounding upslope areas that together form hydrologically and ecologically functional units called vernal pool complexes. These features contribute to the filling and drying of the vernal pool, maintain suitable periods of pool inundation, and maintain water and nutrient quality and soil moisture to enable the Riverside fairy shrimp to carry out their lifecycle; and (3) soils in the summit, rim and basin geomorphic positions, must have a clay component and/or an impermeable surface or subsurface layer, and must provide a unique assemblage of available nutrients and redox conditions known to support vernal pool habitat. The biogeochemical environment strongly influences hydrologic properties and play a critical role in nutrient cycling in vernal pool ecosystems.

***Threats*:** This shrimp is imperiled by a huge variety of threats, including urban sprawl, agribusiness, off-road vehicles, livestock grazing, wetland draining, pollution, invasion of non-native plants, fire, and fire-suppression activities. The species has a USFWS recovery priority of SC, indicating that it is a species facing a high degree of threat and having a low potential for recovery. The "C" indicates that the species may be in conflict with construction or development projects.

Stressors:

- Operation of action-related vehicles and equipment, as well as foot traffic during the inundation period, in an occupied area could cause injury to the species;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could potentially result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable soil habitats.

***Period of Greatest Sensitivity to Proposed Action*:** During periods of hatching of the eggs and cysts from January to March, and continuing until pools are dry.

Protective Measures:

- Before initiating the proposed Action within areas identified as potentially suitable habitat for Riverside fairy shrimp or vernal pool fairy shrimp, a USFWS-approved biologist will conduct habitat suitability surveys to determine whether suitable habitat is present. Actions undertaken within suitable habitat or areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp will be delayed until the vernal pools have entered their dry phase. Actions within areas of suitable habitat during the dry phase shall be conducted on foot, and to the extent feasible activities shall be limited to those that do not disturb biota or soil structure. In the event that a biota or soil disturbing activity is required within vernal pool branchiopod habitat in order to meet the objectives of the Action, the Applicant will consult with USFWS regarding additional avoidance and minimization measures based upon the conditions at that time.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and/or habitat. Cutting will be performed under the supervision of the biologist.

- Vernal pools, or other spreading navarretia that provides suitable vernal pool branchiopod habitat, will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat. If significant negative effects result from the proposed changes, measures will be taken to divert flow to provide the necessary quantity of surface water to the habitat.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Riverside fairy shrimp, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- Gamma scanning surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Gamma scanning surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- When conducting geophysical surveys within occupied areas, appropriate equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Geophysical surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Geophysical surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitor well is located within or adjacent to areas occupied by the Riverside fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the Riverside fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

VERNAL POOL FAIRY SHRIMP

Species: *Branchinecta lynchi*

Status: Threatened

Habitat: Vernal pool fairy shrimp are usually found in vernal pools, although they are sometimes found in a range of natural and artificially created ephemeral habitats such as alkali pools, seasonal drainages, stock ponds, vernal swales, and rock outcrops. Individuals have never been found in riverine, marine, or other permanent bodies of water. Vernal pool habitats form in depressions above an impervious soil layer or duripan. Due to local topography and geology, the depressions are part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages. Water movement within complexes allows vernal pool fairy shrimp to move between individual pools. These movement patterns, as well as genetic evidence, indicate that vernal pool fairy shrimp populations exist within and are defined by entire vernal pool complexes, rather than individual vernal pools.

The vernal pool fairy shrimp occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the vernal pool fairy shrimp has been collected from large vernal pools, including one exceeding 10 ha (25 ac) in area, it tends to occur primarily in smaller pools, and is most frequently found in pools measuring less than 0.02 ha (0.05 ac) in area. The vernal pool fairy shrimp typically occurs at elevations from 10 m (33 ft) to 1,220 m (4,003 ft), although the two sites in the Los Padres National Forest have been found to contain the species at an elevation of 1,700 m (5,600 ft) in atypical habitats consisting of vernal pools under a *Pinus jeffreyi* (Jeffrey pine) canopy without a grass understory. The vernal pool fairy shrimp has been collected at water temperatures as low as 4.5 degrees Celsius (°C) (40 degrees Fahrenheit [°F]), and has not been found in water temperatures above about 23°C (73°F). The species is typically found in pools with low to moderate amounts of salinity or total dissolved solids. Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

***Range*:** The vernal pool fairy shrimp is currently found in 28 counties across the Central Valley and Coast Ranges of California, and in Jackson County of southern Oregon. The species occupies a variety of vernal pool habitats, and occurs in 11 of the 17 vernal pool regions identified in California. It is generally uncommon throughout its range and rarely abundant where it does occur.

***Critical Habitat*:** Unit 22A, the Ventura County Unit is within northern Ventura County and contains 18,830 ha (46,531 ac) of critical habitat for the vernal pool fairy shrimp, of which 790 ha (1,951 ac) is privately owned, and the remainder is within the Los Padres National Forest. Unit 22A is within U.S. Geological Survey (USGS) Alamo Mountain, Lion Canyon, Lockwood Valley, San Guillermo, and Topatopa Mountains quadrangles.

***Primary Constituent Elements*:** (1) Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described below, providing for dispersal and promoting hydroperiods of adequate length in the pools; (2) depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands; (3) sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding; and (4) structure within the pools described above, consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

***Threats*:** The vernal pool fairy shrimp is threatened by development and agricultural conversion, military activities, flood control projects, road construction, recreational use, and non-native species introduction, as well as other factors.

Stressors:

- Operation of action-related vehicles and equipment, as well as foot traffic during the inundation period, in an occupied area could cause injury to the species;
- Mowing and brush cutting of large portions of the Action Area could change the quantity and pattern of runoff, which could potentially result in an indirect impact to the species by altering the quantity of water flowing to vernal pools or other suitable soil habitats.

***Period of Greatest Sensitivity to Proposed Action*:** During periods of hatching of the eggs and cysts from January to March, and continuing until pools are dry (for small pools such as those which could occur at SSFL; expect a longer period for larger pools).

Protective Measures:

- Before initiating the proposed Action within areas identified as potentially suitable habitat for Riverside fairy shrimp or vernal pool fairy shrimp, a USFWS-approved biologist will conduct habitat suitability surveys to determine whether suitable habitat is present. Actions undertaken within suitable habitat or areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp will be delayed until the vernal pools have entered their dry phase.

Actions within areas of suitable habitat during the dry phase shall be conducted on foot, and to the extent feasible activities shall be limited to those that do not disturb biota or soil structure. In the event that a biota or soil disturbing activity is required within vernal pool branchiopod habitat in order to meet the objectives of the Action, the Applicant will consult with USFWS regarding additional avoidance and minimization measures based upon the conditions at that time.

- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- Vernal pools, or other spreading navarretia that provides suitable vernal pool branchiopod habitat, will be qualitatively monitored to determine whether cutting or mowing of vegetation results in substantial changes in the pattern of runoff flows that contribute to seasonal inundation of the habitat. If significant negative effects result from the proposed changes, measures will be taken to divert flow to provide the necessary quantity of surface water to the habitat.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the vernal pool fairy shrimp, its primary constituent elements and habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on habitat that is suitable to the species.
- Gamma scanning surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Gamma scanning surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- When conducting geophysical surveys within occupied areas, appropriate equipment shall be used that minimizes physical damage to the species, its primary constituent elements and habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Geophysical surveys undertaken within areas occupied by Riverside fairy shrimp or vernal pool fairy shrimp shall be delayed until the dry phase as determined by a USFWS-approved biologist. Geophysical surveys within areas of suitable habitat during the dry phase shall be conducted on foot, and only activities that do not disturb biota or soil structure shall be permitted.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species, its primary constituent elements and habitats.
- If a monitor well is located within or adjacent to areas occupied by the vernal pool fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist

to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the vernal pool fairy shrimp, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species, its primary constituent elements and habitats.

SAN FERNANDO VALLEY SPINEFLOWER

Species: *Chorizanthe parryi* var. *fernandina*

Status: Candidate

Habitat: SFVS is clearly a plant of open habitats, free of shade and competing plants. A small fraction of the plants are known to grow among tall annual grasses or shrubs, and all significant clusters of plants are on open-soils. These areas are not only in full sunlight, but strikingly free of dense exotic grasses. Furthermore, the plant exhibits a wide range of tolerance to soil types, chemistry, and compaction; prefers acidic, fine-sand colluvium that is low in nitrogen, and possibly permeated with mycorrhizal mycelium; is shade and competition intolerant, and is a hardy plant which exploits disturbance by natural bioturbation and anthropogenic processes. It occurs at elevations between 200 and 350 m (656-1,148 ft).

***Range*:** Extant in northeastern Santa Susana Mountains (Newhall Ranch) and southeastern Simi Hills (Upper Las Virgenes Open Space Preserve, formerly Ahmanson Ranch). Historical occurrences in Liebre Mountains (Castaic, Lake Elizabeth), San Gabriel Mountains (Little Tujunga Wash), Los Angeles Basin (Hollywood), and in the San Fernando Valley (Chatsworth, San Fernando Wash).

***Critical Habitat*:** No critical habitat has been designated.

***Primary Constituent Elements*:** No primary constituent elements have been identified, see Habitat discussion above.

***Threats*:** The threats to this plant are high in magnitude due to its concentration in two isolated areas. The existence of only two areas of occurrence, and a relatively small range, makes the variety highly susceptible to extinction or extirpation from a significant portion of its range due to random events such as fire, drought, or erosion. The primary threat from habitat destruction by development is non-imminent due to the ongoing development of a Candidate Conservation Agreement. USFWS retained a listing priority number of six for *Chorizanthe parryi* var. *fernandina* due to a high magnitude of non-imminent threats.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches could result in direct damage to living plants;
- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of action-related vehicles and equipment in the occupied area could cause mechanical injury to the plants;
- Operation of action-related vehicles and equipment could serve to transport invasive weeds from known infested locations elsewhere within the Action Area.

***Period of Greatest Sensitivity to Proposed Action*:** During growth, flowering and seed production of the species, estimated as January through July.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Before initiating the components of the proposed Action, a USFWS-approved biologist shall conduct surveys to identify areas exhibiting suitable habitat for San Fernando Valley spineflower. Potential suitable habitat areas shall be appropriately demarcated with flagging or fencing, and no Actions shall be undertaken in those areas until it has been determined whether or not they support the candidate species. In areas identified as potentially suitable habitat for San Fernando Valley spineflower, a USFWS-approved biologist shall conduct presence and absence surveys at the appropriate time of the year, March to June, to determine whether these species are present. Actions undertaken within areas occupied by San Fernando Valley spineflower shall be delayed until the dry phase, after plants therein have become senescent, typically by late July.
- Within the two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Mowing and brush cutting in areas determined to support San Fernando Valley spineflower will be done manually, using hand-saws, pruners, chain saws, bow saws, etc., by personnel specifically field-trained to carry out these avoidance and minimization measures. Reasonable care will be taken not to damage soil structure during the brush cutting, or when moving cut brush to temporary stockpiles.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the San Fernando Valley spineflower and its habitats. Scanning undertaken in or adjacent to

occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the candidate species.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the species and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- Locations of soil sample surveys shall be selected to avoid listed species. Where contact cannot be avoided, consultation with the USFWS will be conducted to take measures that will not adversely affect the species.
- If a monitor well is located within or adjacent to areas occupied by the San Fernando Valley spineflower, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sample activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

SANTA SUSANA TARPLANT

Species: *Deinandra minthornii*

Status: California rare

Habitat: Grows in crevices in sandstone bluffs and outcrops in chaparral and coastal scrub, 280-760m (919-2,493 ft) elevation. Also occurs at one location in Santa Monica Mountains, north of Lake Sherwood on west-facing cliffs on Conejo volcanic breccia; the only occurrence not associated with sandstone. It typically grows directly upon and within sandstone rock crevices, or in soil in very close proximity to rocks. Mulroy indicates it grows in cracks in asphalt and concrete at one remediated site at SSFL.

***Range*:** Restricted to the Simi Hills, Santa Susana Mountains, and Santa Monica Mountains of Los Angeles and Ventura counties.

***Critical Habitat*:** No critical habitat has been designated for this species.

***Primary Constituent Elements*:** No primary constituent elements have been identified for this species.

***Threats*:** Residential development, road and maintenance activities.

Stressors:

- Mowing and brush cutting of the occupied area to a height of approximately six to 18 inches. This species is intimately associated with rocks, typically associated with cracks and fissures, but also occurring sparingly in cracks in asphalt and concrete, and on some hard-packed remediated soils. In large degree, mowing and brush cutting will not be required on the rock surfaces in order to facilitate scanning. However, attendant brush adjacent to these rock faces will need to be cut, and accidental damage to these plants could occur. This could result in direct damage to living plants that could result in premature mortality or reduced seed production;

- Reduction in numbers and diversity of pollinating insects, which could be caused by mowing or cutting associated plant species with flowers that attract shared pollinators;
- Operation of ation-related vehicles and equipment in the occupied area and Critical Habitat could cause mechanical injury to the plants. The rockland habitats where Santa Susana tarplant occurs may preclude the use of some equipment being operated thereon.

***Period of Greatest Sensitivity to Proposed Action*:** At all times of the year.

Protective Measures:

- Before entering natural habitat areas, action-related vehicles and equipment brought to the Action Area from off-site locations will be cleaned to prevent the transport and introduction of invasive plant species to site. Additionally, those vehicles and equipment that have been operated in areas of invasive weed infestations, especially that of yellow star-thistle (*Centauria melitensis*), shall be cleaned before entering other natural habitat areas.
- Within two weeks before initiation of vegetation cutting activities, a USFWS-approved biologist will survey the Action Area to delineate and flag the locations of individuals and habitat. Cutting will be performed under the supervision of the biologist.
- During brush cutting, the root systems of perennial and woody plant species will not be disturbed.
- Vegetation cutting activities undertaken within or adjacent to areas occupied by Santa Susana tarplant will be performed with care by field-trained personnel under the supervision of a USFWS-approved biologist, so as not to damage or dislodge any of these plants. To further prevent impacts to individual plants, the USFWS-approved biologist will flag the species in advance of vegetation cutting activities.
- When conducting gamma scanning surveys within occupied areas, scanning equipment shall be used that maximizes the sensitivity of the scanner and minimizes physical damage to the Santa Susana tarplant and its habitats. Scanning undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.
- When conducting mule-mounted gamma scanning within occupied areas, the mule handler shall prevent the mule from grazing on the listed species.
- Gamma scanning surveys conducted within areas occupied by Santa Susana tarplant will be supervised by a USFWS-approved biologist. When scanning over or adjacent to individuals, the biologist will carefully hold the branches down or out of the way to allow the scanning equipment to access the area. Where using the hand scanner in rocky areas, if scanning down to six inches would result in breaking of Santa Susana tarplant branches, the height of the scanner will be backed off to 12 to 18 inches above the ground.
- When conducting geophysical surveys within occupied areas, survey equipment shall be used that minimizes physical damage to the Santa Susana tarplant and its habitats. Surveys undertaken in or adjacent to occupied areas shall be performed with care by field-trained personnel and under the supervision of a USFWS-approved biologist.

- Locations of soil sample surveys shall be selected to avoid the species. Where contact cannot be avoided, consultation with the USFWS will be conducted to identify a specific location within or adjacent to the occupied habitat to minimize the effect to the species and to determine the appropriate equipment that will avoid physical damage to the species and its habitats.
- If a monitor well is located within or adjacent to areas occupied by the Santa Susana tarplant, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.
- If surface water and sediment sampling activities are to be located within or adjacent to areas occupied by the species, the monitor well sample crew shall coordinate with a USFWS-approved biologist to take measures to minimize physical damage to the species and its habitats.

APPENDIX H

LIVESTOCK MANAGEMENT PROTOCOLS
REVISION 0, MARCH 2010

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Mules will be used to carry gamma scanning equipment through rough terrain inaccessible by wheeled vehicles. Mammoth mules have been selected as they are larger animals capable of bearing the weight of the equipment. The mules will be managed by a handler on horseback. This protocol details the protocols that will be employed to manage the mules, schedule work days and tend to their care during the execution of field activities.

Site Preparation

Site preparation will include establishing a corral with ancillary items, installing feed storage vessels, and management of mule waste. Each of these items is discussed below.

Temporary Corral and Barn

A temporary corral will be erected around the northern end of the building positioned on the southern portion of the on-site office property. This building is hereafter referred to as the barn. Livestock will be housed in the corral and barn during non-working weekday hours and during rest periods. The corral will consist of approximately fifteen 12-foot by 6-foot panels and will enclose hay mangers, a stock tank, feed storage containers and 10 to 15 inches of base sand. Before the corral is erected, the area will be cleaned to remove existing soil and debris. The barn currently contains shelves, which will be removed and transferred to the on-site office located at Building 204.

Storage Vessels

To help control rodents AND adhere to general site sanitation, livestock feed such as hay and oats will be stored in connex boxes and/or 55-gallon ring-top steel drums. Two 8-foot wide by 8-foot tall by 20-foot long connex boxes will be placed in proximity to the corral and barn.

Waste Management

All livestock manure, including manure released in the corral and manure excreted during transport and scanning activities, will be collected and containerized in a green dumpster. The manure placed in the dumpster will be transported off site to a compost pile, then used as fertilizer. The dumpster will be emptied as needed.

General Animal Care

A health certificate for each animal will be maintained on site. If the handler determines that any of the livestock has a health issue that cannot be managed on site by the handler, the handler will either transport the animal to the veterinarian or, in severe cases, the veterinarian will travel to the site. It is anticipated that the veterinarian for this project will be Dr. Roueche (clinic telephone number: 616-259-7745). An equine first aid kit will be stored on site and will

include at a minimum the following items: bandages, iodine, and ointment to repel flies, furazin for wounds, pain killers, wound dressings, hoof treatment, Cut-n-Heal, and blue ointment.

Animal Routine (Work Day)

It is anticipated that there will be four mammoth mules and one horse at the site each work day. The mules will be rotated so that each day two mules will be used to scan locations while the other two mules rest at the barn and corral. Due to the light work load, the same horse will be used throughout the duration of the project. The horse will only be used to retrieve mules that have run away. The maintenance activities for the mammoth mules and horse are described below.

Pre-Scanning Activity Routine

Prior to the work day:

- The livestock will be brushed and curry combed.
- Livestock will be administered a Red Cell vitamin supplement.
- The horse and mules will be restrained and muzzled to prevent them from eating vegetation.
- A bun bag will be strapped to the mule to collect manure.

On-Going Routine

Depending on the proximity of the scanning locations to the barn and corral, the livestock will either be walked or be transported using a trailer to the assigned area. The handler will lead the mules at all times. The two working mules will be rotated on an as-needed basis, which will be determined by the handler. The livestock will be given a break of at least 30 minutes during the crews' lunch period. During this time, the mules and horse will be provided with water. During the lunch break, the mule will be inspected by the handler for cuts or injuries, and the saddle may be removed depending on the condition of the mule.

The bun bag will be monitored by the handler and emptied on an as-needed basis. The manure removed from the bun bag will be accumulated in a trash bag until it can be hauled to the green dumpster. Livestock will have their hooves trimmed at a minimum of every six weeks.

Post-Scanning Activity Routine

End of the work day:

- The mule will be rinsed with fresh water, inspected for cuts, hoof breaks, or material lodged in frogs, and will be treated as necessary.
- The saddle pad will be rotated and inspected.
- All restraints and muzzles will be removed.
- The animal will be brushed, and not curry combed.

- Approximately 35 pounds of Pack Service Certified hay (weed free), two pounds of feed ration (oat, barley and corn mix) and fresh water will be provided to each animal. Animals will be monitored during feeding to ensure hording does not occur.
- The livestock will be secured in the corral for the evening.

Animal Routine (Weekend)

During the weekends and other down time (for example: holidays and rainy periods), the livestock will be stored and maintained by the owner at Movin' on Livestock and not on site. The handler will transport the animals to the site on Monday morning and return them to the owner on Friday evening.

APPENDIX I

HAZARDOUS MATERIALS MANAGEMENT AND SPILL RESPONSE PROCEDURES REVISION 0, AUGUST 2010

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HAZARDOUS MATERIALS MANAGEMENT AND SPILL RESPONSE PROCEDURES
REVISION 0, AUGUST 2010

Field activities associated with the U.S. Environmental Protection Agency's (USEPA) proposed action at the Santa Susana Field Laboratory (SSFL) site require that hazardous materials reside at the site periodically. This protocol summarizes the hazardous materials management and spill response measures that will be taken to protect worker safety and the environment. Procedures for managing investigation-derived waste storage/staging areas are detailed in Appendix J.

Applicable Federal and State Laws, Local Regulations and Executive Orders

USEPA is conducting this project pursuant to federal legislative mandate 2764, the Consolidated Appropriations Act of 2008, and the authority granted under the Comprehensive Environmental Response, Compensation and Liability Act. USEPA intends to comply with the substantive requirements of applicable federal and state laws, local requirements and regulations and executive orders applicable for this site described in Table 5.1 of the Site Management Plan (SMP) and listed below:

- Ventura County Fire Protection District Fire Code Chapter 34 and NFPA 385
- California Code of Regulations, Title 8, Section 5192, Hazardous Waste Operations and Emergency Response
- 40 CFR 260 through 268, 270 through 273 and 279 through 283

Emergency Contact Information

The person responsible for managing, implementing, and maintaining this procedure is Steve Vaughn, Field Operations Manager. His designated alternate is Rod Collins, Site Safety and Health Officer. These individuals have knowledge and training associated with the HAZWOPER First Responder Operations Level requirements. Project emergency contact information follows:

- Project site office (818) 466-8058
- Steve Vaughn, office (818) 466-8059; mobile (520) 576-4012
- Rod Collins, office (818) 466-8135; mobile (818) 466-8135
- Boeing Communication Center Emergency Line (818) 466-8911

General Management Protocols

All personnel have responsibility for spill prevention. Any HGL employee who notices a leak will respond as appropriate based on their training. If a spill occurs, personnel will assume a defensive posture by avoiding the area and immediately notifying the Field Operations

Manager. Measures to be implemented at the program level to manage hazardous materials, prevent spills, and establish contingencies for spills are:

- Security – Proper site security is important to minimize accidents, trespassing, and potential spills and releases. Activity hours are 6:00 a.m. to 5:30 p.m. throughout the term of this project. Equipment staging and maintenance areas, hazardous material staging areas, and waste storage areas are located within a fenced area with restricted access. The fence and all heavy equipment will be locked at the end of each workday. Only authorized personnel are permitted onto the project site.
- Site Inspections - HGL will conduct daily inspections of the equipment, vehicles, hazardous material staging area and waste storage areas to ensure that vehicles are in good repair, no leaks are evident, and that spill control kits are available. Inspections of the project site for general housekeeping and implementations of best management practices will be performed weekly. Any instances of nonconformance with this field protocol will be reported immediately to the Field Operations Manager for action.
- Personnel Training - HGL employees will receive training on the requirements of this procedure including spill prevention measures, spill source and receptor recognition, spill containment techniques, spill response measures, and spill reporting protocol. HGL personnel are required to know the location and content of the Hazard Communication (HazCom) station located in Building 204.

Potential Sources of Hazardous Materials

Materials and equipment brought on site are potential sources of hazardous materials. Excluding diesel fuel, the quantities of hazardous materials anticipated to be retained at the site will be less than the reportable quantity for each respective material. Procedures for managing each potential source are provided below:

Equipment Staging and Maintenance Area

- Drill rigs, scanning vehicles, pickup trucks and generators - Heavy equipment and smaller portable equipment will be stored in a secured equipment parking area adjacent to Building 204, and inside Building 204. To the extent possible, all repairs and routine maintenance will be performed in this area as well. The hazardous materials associated with this activity/operation are:
  - Gasoline
  - No. 2 diesel
  - Lubricating oil
  - Hydraulic oil
- Nuclear density gauge – The radioactive material used in the gauge is encapsulated in two stainless steel capsules, which are sealed by welding. The gauge is designed to prevent leakage or escape of the radioactive material. The hazardous materials associated with this activity/operation are:
  - Cesium 137

  - Americium/Beryllium – to generate neutrons
- Radioactive check sources –A radioactive check source is used to check the response of a radiation counter for quality control purposes. While the radioactive check sources are not of sufficient level to be considered a hazardous material and thus are not regulated, it is important that they be managed and carefully controlled in accordance with common radiological safety practices. The hazardous materials associated with this activity/operation are:
  - Europium-152
  - Cesium-137
  - Strontium-90
  - Cobalt-60
  - Thorium-230
- Hazardous Materials Storage Areas – Hazardous materials will be on site in the form of sample preservative, cleaning agents, calibration gas and binding solvents. The hazardous materials associated with this activity/operation are:
  - Nitric acid (less than 5 gallons)
  - Isobutylene calibrations gas (less than 174 liters)
  - Solvents (less than 1 gallon)
  - Volatile organic compounds

Spill Prevention Procedures

Procedures will consist of best management practices to minimize the potential for a spill of hazardous material to the environment. Procedures for spill prevention include the use of both engineering and administrative controls in the potential sources areas. These procedures are provided by source below:

Equipment Staging and Maintenance Areas

- Store and maintain equipment in a designated area.
- Reduce the amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials.
- Use secondary containment (drain pan) to catch spills when removing or changing fluids.
- Use proper equipment (pumps, funnels) to transfer fluids.
- Keep spill kits readily accessible. Contents:
  - Absorbent pads
  - Absorbent tubes
  - Disposal bags
  - Goggles
  - Gloves
  - Emergency response handbook
  - Chemical resistant polyethylene container

- Check incoming vehicles for leaking oil and fluids.
- Transfer used fluids and oil filters to waste or recycling drums.
- Inspect equipment routinely for leaks and spills.
- Repair equipment immediately, if necessary.
- Implement a preventative maintenance schedule for equipment and vehicles.

Nuclear Density Gauge

The radioactive material contained in this gauge is solid and even if broken will not result in a release as broken materials will be contained within the protective shield of the instrument. Due to the construction and encapsulation of the radioactive material within the gauge there is little possibility of a release. However, procedures for handling the gauge and preventing potential releases are contained in the Nuclear Density Gauge Field Operating Procedure. The following spill prevention measures will be used:

- The nuclear density gauge will be stored in the shed within the fenced area directly north of the Building 204.
- The gauge will be locked under four levels of security: 1) building, 2) locker, 3) case, 4) instrument.
- Signage will be posted on the building indicating it is a radiological materials area and access will be restricted.
- When in transport, the gauge will be locked and securely fastened to the truck bed.
- At no time will the gauge be left unattended or in the possession of an unauthorized user.
- The gauge will be inspected at regular intervals as specified by the Radiation Safety Officer.

Radiation Check Sources

Radiation check sources consist of small, solid, round plastic discs containing low levels of various radionuclides that are used to check the sensitivity of various radiation detection equipment. These radioactive sources are not considered a hazardous material but access to and use of these sources is controlled. The check sources are stored inside of Building 204 in a locked cabinet to prevent access by unauthorized personnel.

Hazardous Materials Storage Area

Control and minimization measures that will be implemented for the Hazardous Materials Storage Area are:

- Reduce the amount of hazardous materials by substituting nonhazardous or less hazardous materials.
- Minimize the quantity of hazardous materials brought on-site.
- Store hazardous materials in a designated area away from drains.

- Store hazardous materials in proper cabinets.
- Use all products before disposing of the container.
- Retain the original product label or material safety data sheets (MSDS). The MSDSs will be contained in the HazCom station.
- Recycle any useful material
- Segregate material by type.
- Train employees in proper hazardous material management.

Spill Containment Methods

This section describes the measures to be taken in the event of a spill or release from the sources identified above. A spill response contractor will be responsible for cleanup activities when HGL does not have the training, equipment or materials to cleanup spills safely and effectively. HGL and USEPA will determine when HGL's spill response capabilities have been exceeded.

Equipment Staging and Maintenance Area – A leak from a fuel tank, equipment seal, or hydraulic line will be contained in a drain pan placed beneath potential leak sources. Spills from leaks not contained within a drain pain will be managed as follow:

- Contained with sorbent tubes.
- Spill surface cleaned with sorbent pads.
- Surface soils removed and contained in stored properly labeled drums, if applicable.

Nuclear Density Gauge – Spill containment measures are not applicable. The gauge is a sealed source designed to prevent leakage or escape of the radioactive material.

Radiation Check Sources – Spill containment measures are not applicable. Radiation check sources are small, solid, round plastic discs.

Hazardous Materials Storage Area – Based on the estimated volume of preservatives and calibration gases that may be stored on site, spill from the waste storage area may release up to 5 gallons of hazardous materials or 174 liters of calibration gas. A spill of liquid will be contained using a spill response kit. A release of calibration cannot be cleaned up. To prevent exposure, the room where the release occurred will be vented to the outside until the vapors have cleared.

Spill Response Procedures

Response in the first 10 to 15 minutes is critical to minimize the impacts to human health and the environment and to minimize property damage and cleanup costs. All personnel responding to a spill or providing support to responders should first don the proper personal protective equipment.

Procedure 1 – Chemical did NOT Directly Contact Personnel

HGL will respond immediately to spills of regulated materials. Only personnel and sub-contractors trained to respond to spills will conduct response measures. The standard approach for spill response is as follows:

Assess Hazard

- Stop operations.
- Notify Steve Vaughn.
- Determine if the spill is "incidental" by evaluating:
  - Spilled material is known and definable (through the MSDS or laboratory results).
  - HGL has the resources (trained people, equipment, and supplies) on site to safely and effectively respond to the spill.
- If at least one of the above of criteria are not met, the spill is not "incidental". Direct safe evacuation of the area and notify the Boeing emergency center.
- If the spill is determined to be incidental, then:
  - Assess the quantity of substance spilled from an upwind location and safe distance.
  - Assess the extent of the affected area from an upwind location and safe distance.

Secure Spill Response and Personal Protective Equipment

- Secure the area.
- Obtain appropriate spill response equipment and don personal protective equipment.

Contain and Eliminate Spill Source

- Contain the spill to prevent entry to catch basins, storm drains, or ditches.
- Seal or stop the source of the spill by sealing containers or providing containment.

Procedure 2 – Chemical Contacted Skin

- At the location of contact, a coworker should immediately wash the affected area with water. This coworker will monitor the exposed individual throughout the process.
- Contact a site supervisor via radio or cell phone.
- Transport the individual to Building 204 and thoroughly wash the area for 5 minutes with a deluge of water in the shower. Remove and decontaminate jewelry, watches, etc.
- Consult the MSDS located in the HazCom station for health and safety considerations and symptoms of exposure
- Decontaminate the inside of the vehicle that transported the exposed individual to Building 204 using contents from the spill kit.
- Proceed with the steps listed under Procedure 1.

Procedure 3 – Chemical Contacted Eye

- A coworker should aid the exposed individual by immediately flushing the affected eye with water. This coworker will monitor the exposed individual throughout the process.
- Contact a site supervisor via radio or cell phone.

- Transport the affected individual to Building 204 and thoroughly wash the area for 15 minutes with a deluge of water in the shower.
- Consult the MSDS for health and safety considerations and symptoms of exposure
- Decontaminate the inside of the vehicle that transported the exposed individual to Building 204 using contents from the spill kit.
- Proceed with the steps listed under Procedure 1.

Mitigating, Removing, and Disposing of Spilled Material

Only trained personnel will perform spill cleanup activities. A spill response contractor will be responsible for cleanup activities as a result of spills or leaks when HGL does not have the appropriate training, equipment, or materials to respond.

- Spills onto the ground (Soil):
  - Clean up the spill immediately.
  - Apply absorbent material; berm, divert or contain the spill.
  - Collect spilled material and place into labeled drums.
  - Collect absorbent and other material used to clean up the spill, label the container, and properly dispose of waste at an approved disposal facility.
  - Decontaminate the affected area, equipment and surfaces that have contacted the spilled material.
  - Restore habitat, if necessary.
- Spills into waterways
  - Due to site conditions, spills into waterways are not anticipated during this project.

Reporting

The HGL responsible person for this procedure is Steve Vaughn. He will contact the regulatory agencies regarding spill response activities when necessary.

The reporting requirement for all leaks, spills, and other incidents are as follows:

- HGL personnel and subcontractors will report to the Field Operations Manager.
- HGL will report to USEPA and other regulatory agencies as necessary.
- HGL will prepare and submit an incident report to the USEPA on-site project manager.

APPENDIX J

INVESTIGATION-DERIVED WASTE MANAGEMENT PROCEDURES REVISION 0, AUGUST 2010

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INVESTIGATION-DERIVED WASTE MANAGEMENT PLAN
REVISION 0, AUGUST 2010

This document describes the waste management guidelines for managing investigation-derived waste (IDW) that will be generated during site investigation activities conducted as part of the radiological characterization study within the Area IV Study Area at the Santa Susana Field Laboratory facility located in Ventura County, California.

Applicable Federal and State Laws, Local Regulations and Executive Orders

USEPA is conducting this project pursuant to federal legislative mandate 2764, the Consolidated Appropriations Act of 2008, and the authority granted under the Comprehensive Environmental Response, Compensation and Liability Act. USEPA intends to comply with the substantive requirements of applicable federal and state laws, local requirements and regulations and executive orders applicable for this site described in Table 5.1 of the Site Management Plan and listed below:

- U.S. Environmental Protection Agency 40 Code of Federal Regulations (CFR) Parts 261, 262, and 268 – Provides federal hazardous waste management regulations for classification of hazardous wastes, generator standards (including manifesting), and land disposal restriction notification requirements.
- U.S. Environmental Protection Agency 40 CFR Part 243 – Provides guidelines for the storage and collection of Residential, Commercial, and Institutional solid waste.
- U.S. Department of Transportation (DOT) Regulations, 49 CFR 172, et seq.– Provides the requirements for packaging, marking, labeling, and transporting hazardous materials on public roadways.
- State of California Code and Regulations Title 22 - Provides the state of California hazardous waste management regulations and guidance for the classification and generation of hazardous wastes.
- California Health and Safety Code, Division 20, Chapter 6.5, Hazardous Waste Control - Provides the state of California hazardous waste management regulations and guidance for the classification, generation, and transportation of hazardous wastes.
- Ventura County, California Code of Ordinance, Watershed District Well Ordinance 4184, - Provides the County of Ventura, California Well and Test Hole abandonment regulations and guidance.

Waste Characterization

The types of field investigation activities that will be performed during this project include radiological surveys, vegetation removal, surface soil sampling, subsurface soil sampling, sediment sampling, surface water sampling (streams, ponds, seeps), and groundwater sampling. As a result of these activities, solids and liquid IDW will be generated. The IDW

will be characterized as either Resource Conservation & Recovery Act (RCRA) non-hazardous or RCRA hazardous waste. The IDW characterization will be based on results of historical analytical results, past radiological investigation results, and specific waste disposal facility analytical requirements (Toxicity Characteristic Leaching Procedure and/or Waste Stream Profile samples). For disposal purposes, USEPA will be listed as the generator for all IDW characterized as RCRA hazardous waste.

The IDW that will be generated during this investigation will include but will not be limited to:

- Personnel protective equipment (PPE) - This includes disposable coveralls, nitrile gloves, booties, respirator canisters, splash suits, etc.
- Disposable sampling equipment and items - This includes plastic sheeting, aluminum foil, glass sample jars, plastic zip lock bags, polyethylene bailers, etc.
- Vegetation waste - This includes poison oak that will be removed to provide access for gamma scanning equipment and will be disposed of off site.
- Excess soil from subsurface soil sampling activities.
- Monitoring well purge water from groundwater sampling activities.
- Wash water from decontamination of equipment and tools.

The sections below describe the approach that will be used to properly manage each IDW waste stream generated during this project. Table J-1 summarizes the types and estimated volumes of each anticipated IDW and the recommended disposal approach.

Contaminants of Interest

Past research activities at SSFL has included the development of civilian nuclear power within the Area IV Study Area therefore, radionuclides are a contaminant of interest. In addition to radionuclides, historical analytical results for groundwater and surface water samples collected from groundwater monitoring wells in the Area IV Study Area show volatile organics (chlorinated solvents and hydrocarbons) and metals are present at elevated concentrations.

Management of Personal Protective Equipment and Disposable Sampling Tools and Supplies

All disposable PPE, sampling equipment, and general refuse generated within the Area IV Study Area during soil sampling activities will be radiologically screened in the field, as described in the Personnel Decontamination Procedures provided in Appendix O, before it is allowed to leave the work area.

If the results of the field radiological screening show no radiological contamination, these materials will be characterized as a RCRA non-hazardous solid waste and will be placed in a trash dumpster for disposal at a municipal landfill. If the results of the field radiological screening indicate the presence of radiological contamination, these materials will be

characterized as RCRA hazardous waste. The hazardous waste will be double bagged in yellow plastic bags, clearly marked as Radioactive Material, placed in a DOT-approved 55-gallon drum, and handled as low-level radioactive waste. These drums will be labeled with a description of the contents, date of accumulation, contact person and telephone number, radiation field intensity at the drum surface as well as results of removable contamination. These drums will be staged in a controlled area and moved as soon as reasonably possible to the Radioactive Material Handling Facility (RMHF) on site.

Management of Vegetation Cuttings

Grass and shrub cuttings will be collected in covered roll-off bins or temporarily stored on the ground, at designated locations. This material will later be chipped or shredded into mulch and returned to the approximate area from which it was cut.

Trimmings from poison oak and non-native invasive species will be separated and stored in a bin for subsequent off-site disposal. The non-native vegetation debris will be placed in pre-defined areas to reduce the transport of non-native plants to other areas, in accordance with procedures provided in Appendix E. All stockpiled material will be covered to reduce the potential for transport by wind and redistribution of seeds. The non-native cuttings will be handled as a RCRA non-hazardous solid waste.

Management of Soil Investigation-derived Waste

Excess soil generated from subsurface soil sampling activities will be placed back into the soil boring after the required sample volume has been collected. Medium-sized bentonite chips will be used to fill any void space left after the soil has been placed back in the borehole.

Management of Purge Water and Decontamination Water

Historical analytical results have shown elevated levels of trichloroethene in groundwater samples collected from monitoring wells in the Area IV Study Area. Based on this historical data, the monitoring well purge water and equipment decontamination water will be temporarily containerized on-site and characterized as RCRA F-listed hazardous waste. The purge water will be stored in 18,000-gallon double-walled frac tanks. The water generated from decontamination activities will be stored in 500-gallon polyethylene (poly) tanks. Each container will only be filled to 80 percent of volume capacity.

A wastewater disposal contractor will be used to transport and dispose of the IDW water in compliance with federal, state, and local regulations. The contractor will be responsible for loading, manifesting, and transporting the water to a wastewater treatment facility (WWTF). The WWTF will be USEPA Off-site Rule (OSR) approved and the contractor will provide documentation certifying proper manifesting and disposal of the IDW water.

Historical analytical data also show that groundwater samples collected from four monitoring wells have consistent concentrations of tritium above the maximum contaminant level of 20,000 picocuries per liter (piC/L). The purge water and decontamination water associated with these wells will be segregated from the purge water from other wells and will be temporarily containerized in 275-gallon poly tanks. The poly tanks will be inside 25-yard roll-off boxes which will be used for secondary containment in the event there is leakage from the poly tanks. The tritiated purge water will be stored inside Building 015 located in Area IV while awaiting disposal.

Upon completion of the groundwater sampling event a profile sample will be collected of the potentially tritiated purge water. If the levels of tritium are found to be below 20,000, piC/L consideration will be given to bulking the water with the purge water from the other wells and disposed of at an approved WWTF. If results show tritium concentrations exceeding 20,000 piC/L, the water will be evaporated on site.

The proposed treatment method for the purge water with elevated tritium is to place the water in shallow, open-top tanks or in drums and allow natural evaporation to occur. No additional equipment will be used to accelerate the process. Calculation of the evaporation rate was estimated using estimation methods described in EPA, 1999[1]. Using conservative estimates of wind speed and average site temperature, the evaporation rate is expected to be at least 8.1 gallons per day (approximately 62 days for 500 gallons). Should the observed evaporation be too slow the water will be split into additional holding containers to increase the surface area and therefore the rate of evaporation.

Off-site Shipment of Resource Conservation & Recovery Act Hazardous Waste

Before any IDW that is characterized as a RCRA hazardous waste is allowed to leave the Area IV Study Area IDW staging site, a manifest of hazardous waste will be prepared for each shipment. The manifest will be based on analytical results of the profile sample to characterize the waste stream. After loading the truck, the driver will be handed the manifest for signature. The generator's copy (yellow) will be removed from the manifest package for logging and tracking proposes. The remaining manifest sheets will be handed over to the driver to accompany the shipment to the approved disposal facility. At a minimum, the manifest document will include the following information:

- Name and address of waste generator;
- Name and address of waste transporter;
- Name and address of disposal facility;
- Description of the waste; and
- Quantity of waste shipped.

[1] EPA Risk Management Program for Offsite Consequence Analysis, EPA 550-B-99-009, April 1999

Table J-1
Summary of Disposal Options According to Waste Characterization

IDW Waste Stream (estimated volume)	RCRA Non-Hazardous IDW	RCRA Hazardous IDW	Low-Level Radioactive IDW
Disposable PPE, sampling equipment and supplies (approximately 20 55-gallon drums)	Before leaving a soil sampling site field screen disposable PPE, disposable sampling equipment, and supplies for radiological activity. If the results of the screening show no detectable radiological activity, discard as trash in the dumpster at Building 204.	Soil sampling disposable PPE, disposable sampling equipment, and supplies will only be handled as a RCRA non-hazardous solid waste or low-level radioactive waste if found to be radiologically contaminated.	Before leaving a soil sampling site field screen disposable PPE, disposable sampling equipment, and supplies for radiological activity. If the results of the screening show radiological activity, double bag the material in yellow plastic bags labeled "Radioactive Material", place in a 55-gallon drum, and store at the RMHF.
Soil cuttings (No volume expected to be accumulated)	Soil IDW will be returned to the borehole.	Soil IDW will be returned to the borehole.	Soil IDW will be returned to the borehole.
Purge water and decontamination water (Potentially 20,000 gallons per sampling event.)	All purge water and decontamination water will be collected and placed in frac tanks or poly tanks for temporary on-site storage and characterized as RCRA F-listed hazardous waste.	All purge water and decontamination water will be collected and placed in frac tanks or poly tanks for temporary on-site storage and characterized as RCRA F-listed hazardous waste. The purge water will be disposed of at a WWTF that is USEPA OSR approved.	Purge water with elevated tritium will be segregated from the rest of the purge water and disposed of at an off-site disposal facility licensed to handle radioactive material.

APPENDIX K

FIRE PREVENTION PROTOCOLS
REVISION 0, MARCH 2010

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FIRE PREVENTION PROTOCOLS
REVISION 0, MARCH 2010

Applicable Federal and State Laws, Local Regulations, and Executive Orders

- Ventura County Fire Protection District (VCFPD) Fire Codes and Regulations (Ventura County regulates the storage, handling of combustible materials, hot work, and fire protection).

Combustible materials shall be stored in accordance with fire code sections 316.1 and 316.2. Should any ignition occur fire extinguishment apparatus' shall be available at all activity sites and personnel sites in accordance with fire code sections 316.3 and 316.4. Current Material Safety Data Sheets shall be readily available on the premises for hazardous materials regulated by and in accordance with fire code sections 2703.4, 2704.14, and 304.2.3.2 (VCFPD, 2006). All activities conducted shall comply with the health and safety code section 13871, applicable state and local laws and regulations that relate to fire and life safety.

Emergency Procedures

Specific emergency procedures are detailed in Appendix L.

General Requirements

- No tobacco products of any kind or open flames are allowed on the Santa Susana Field Laboratory property.
- All trash and debris receptacles shall be located away from any building or structure.
- Work areas shall be maintained in a clean state. Excess materials, trash, scrap, and other debris shall be cleaned up and removed whenever the accumulation constitutes a fire hazard.
- Wood, sawdust, or shavings shall not be used as absorbents for spilled flammable or combustible liquids or petroleum lubricants.
- Where flammable atmospheres (vapors, dusts, or mists) exist, electrical equipment shall have appropriate National Fire Protection Association class and division ratings for explosion proofing.
- Stored combustibles will be stored in a containerized and designated storage area.

Fire Extinguishers

- Fire extinguisher type 2-A:20-B:C will be located less than within 30 feet of vegetation removal operations and all areas of hot work

- Where flammable or combustible materials in quantities greater than 5 gallons are present or where hot work will be performed, 10 pound extinguishers rated 4A:60B:C will be present in the immediate area.
- Fire extinguishers will be installed in the project building and will be accessible, marked with signage, and installed at a density of 1 every 500 square feet.
- Industrial trucks including forklifts will maintain fire extinguisher type 4-A:20-B:C within 20 feet of battery charging areas.
- Should any ignition occur a fire extinguisher will be available at work sites in accordance with fire code regulations.
- Monthly inspection of fire extinguishers located at Building 204 will be performed by Boeing with annual inspections conducted and documented by a licensed third party.

Vehicles

- All vehicles, including the ERGS, will be inspected throughout the day, and any brush or grass build-up will be removed
- Exhaust emissions from any vehicles operating within Building 204 shall be piped outside if bay doors are not open.
- Vehicles and equipment will not idle or park in areas where catalytic converters may ignite vegetation.
- Every field vehicle will have an accessible fire extinguisher.

Refueling

- Refueler vehicles shall be permitted with a displayed VCFPD permit No. 125A and comply with VCFPD fire codes and National Fire Protection Association regulations.
- Construction of the refueler vehicle fuel tank shall be designed, constructed equipped and maintained in accordance with the VCFPD fire codes and National Fire Protection Association regulations.
- The refueler vehicle will not be operated unless it is in proper working condition and free of leaks and the accumulation of grease, oil or other flammables.
- Signs prohibiting smoking or open flame within 25 feet shall be posted on the vehicle at all times.
- The refueler vehicle will not transport fuel in excess of 120 gallons.
- Refueler vehicles will be equipped with a minimum 2-A, 20-B:C fire extinguisher in good operating condition with a legible current year service tag attached.
- During fuel dispensing operations, the refueler vehicle wheels will be chocked to prevent movement, spillage or other hazardous motion.
- Refueler vehicles will be equipped with an emergency pump shut-off switch.

- The dispensing hose will not exceed 50 feet in length and the hose and nozzle will be approved for use with gasoline. The hose will be properly placed on the reel or in a compartment before the vehicle is moved.
- Refueler vehicles will be equipped with protection to prevent static charge accumulation during dispensing operations. Protection will consist of a metallic bond wire (grounding strap), permanently connected to the refueling vehicle unit. The grounding strap shall be equipped with a clamp or other securing device and during dispensing operations and will be attached to the equipment that is being fueled.
- Refueler vehicle dispensing equipment will only be operated and controlled by designated personnel who are trained to handle and dispense motor fuels.
- Refueler vehicles will not be left unattended at any place that could present an extreme life hazard.
- Mechanically operated equipment (generators, other vehicles, etc) will be shut down (off) during dispensing operations.
- Dispensing from refueler vehicles will be conducted at least 50 feet from structures or combustibles.

Hot Work

Hot work involves an open flame or the potential to generate sparks or embers. Such activities include use of cutting torches, metal cutting saws, abrasive grinding of metals, welding, brazing, and soldering.

- Any hot work that may be necessary for repair or modification of equipment will be performed at an off-site contracted maintenance or equipment repair facility.
- Hot work must be done with the knowledge of the Site Safety and Health Officer, a fire watch, and suitable fire extinguisher.
- During hot work, screens may be needed to control sparks and ultraviolet exposure.
- Boeing requires a Hot Work Permit be obtained through them, once a permit is acquired from Ventura County Air Pollution Control District.
- Fire extinguishers will be readily available within 30 feet of operations of hot work/welding activities.
- Hot work permits will be issued for specified tasks for one shift only and destroyed at completion of work or when they expire. The fire watch will be dismissed 30 minutes after work has been completed.

Flammable Materials

- All flammable liquids, chemical fuels, resins, lubricants, and solvents will be segregated and labeled.

- Small quantities of flammable liquids may be stored in work areas, or carried in vehicles, providing those materials will be used that day and are in an approved container.
- Flammable wastes will be stored or disposed of in metal containers, clearly marked as containing flammable materials.
- Combustible materials will not be stored within 25 feet of the exterior of structures.
- Storage of combustible materials will be kept to a minimum.
- Fire extinguishers will be readily available within 30 feet of flammable materials storage areas
- All storage areas for flammable or combustible liquids shall be approved by the Boeing Site Safety and Health Officer.

References

Office of the State Fire Marshall, 2009. California Code of Regulations Title-19: Gasoline Containers. June 16th, 2009.

Ventura County Air Pollution Control District, 2008. Staff Report Proposed Rule 55, Fugitive Dust Attachment 6. Ventura, CA. April 8, 2008.

Ventura County Fire Protection District, 2008a. VCFPD Fire Prevention Bureau: Portable Fire Extinguishers. Fire code FP13.6.7. January 2008.

Ventura County Fire Protection District, 2008b. VCFPD Fire Prevention Bureau: Requirements for Refueler Vehicles. Fire code FP13.6.2. January 2008.

Ventura County Fire Protection District, 2006. Board of Directors VCFPD, State of California: Fire Protection District Ordinance NO. 26. Signed November 20th, 2007.

APPENDIX L

EMERGENCY AND CONTINGENCY PROCEDURES
REVISION 0, MAY 2010

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EMERGENCY AND CONTINGENCY PROCEDURES
REVISION 0, MAY 2010

This document summarizes the procedures to be followed should an emergency incident (i.e., chemical spill, fire, etc.) occur while on the Santa Susana Field Laboratory site. Response procedures are provided for handling emergencies that occur within Building 204, and on site. In the event of an emergency or other situation requiring assistance:

1. Immediately call the Boeing Communications Center on Channel 2 of the radio. Identify yourself using the radio identification number that is posted on your radio and/or cell phone (818) 466-8911, or use a Boeing owned desk phone and dial 911.
2. Contact the Site Safety and Health Officer (SSHO) on Channel 1 of the radio and/or cell phone (661) 645-7430.

The Boeing Communications Center will contact the appropriate response team.

Chemical Spills

Performance of the required tasks for the radiological survey at SSFL will not involve large quantities of hazardous liquids. The primary hazardous liquid will be diesel fuel which will be stored in a 90 gallon tank strapped to a pickup truck and will be used to refuel the fork lift. Other liquids will be de minimus quantities and will be managed as described in Appendix K, Fire Prevention Protocols.

In the event of a chemical spill, the amount and hazard of the chemicals involved will determine the appropriate response. A Hazard Communication (HazCom) center has been established adjacent to the safety board on the east wall of Building 204. The HazCom station contains a copy of the HGL Hazard Communication Program, and Material Safety Data Sheets (MSDS) for all chemicals in use for the project. The MSDS lists the reportable quantity of a spill and provides key first aid information. All personnel working on the site, including subcontractors, are required to know the location of the HazCom station and be familiar with the MSDSs for hazardous chemicals used or stored in Building 204 or in surrounding areas.

Maps indicating emergency exit routes for Building 204 are posted at various locations throughout the building, and evacuation drills will be conducted annually. A spill control kit will be maintained at Building 204.

The emergency procedures to be followed in the event of chemical spills, either within Building 204 or on site, are listed below.

Chemical Spill Procedures

- Evacuate immediate area.
- Attend to any persons who may have been contaminated. Consult the MSDS for first aid information.
- Wait in a safe area for the response team.
- Notify the SSHO and personnel working in the area of the spill.
- The SSHO will record and report any reportable spills.
- Isolate the area and evacuate the immediate area if necessary.
- Remove ignition sources and unplug nearby electrical equipment.
- Establish areas of ventilation. Vent vapors to outside of building.
- Confine spill to a small area. Do not allow the material to spread, use appropriate absorbing material to block or contain the spilled material. Use barriers or absorbents to protect floor drains.
- Carefully remove other materials, containers, and equipment from the path of the spill.
- Dispose of all cleanup material as hazardous waste. Waste must be properly packaged in a leak-proof container, sealed, and appropriately labeled. See procedures detailed in the Investigation-Derived Waste Management Plan (Appendix J).
- If the chemical is soluble in water, the area should be washed with warm, soapy water to remove residue remaining after removal of spilled material. The wash water must be captured, containerized, and handled/disposed as investigation-derived waste.

Note: A minor indoor spill involving the release of a type or quantity of a chemical that does not pose an immediate health risk and does not involve chemical contamination to the body may be cleaned up by on-site personnel using spill kits. Each spill kit contains sorbent pads, SOC absorbent tubes, disposal bags, goggles, nitrile gloves, an emergency response handbook, and a chemical resistant polyethylene container.

Chemical Spill on Body:

- Wash thoroughly (15 minutes) with water using the deluge shower located within Building 204 adjacent to the employee break room, or hand/spray unit located at the decontamination station or in the safety vehicle, whichever is nearest. Remove any overlying clothing or jewelry that may retain the chemical and prevent thorough washing of the skin.
- Consult MSDS sheets.
- Depending on the chemical, additional medical treatment may be required.
- Report incident to SSHO.

Chemical Spill in Eye:

Immediately flush eyes with copious amounts of water for at least 15 minutes, removing contact lenses if possible. An eyewash station will be available at every on-site work location.

There are two eyewash stations located in Building 204 on the east wall of the field sampling equipment room and the gamma equipment store room on the west wall.

Fires

Specific fire prevention protocols are detailed in Appendix K. This section details emergency response procedures for fires that may occur within Building 204 and wildfires that may occur on site while field crews are deployed.

Fire Response Procedures for Building 204

Building 204 is equipped with smoke alarms and a carbon monoxide detector, the system is monitored for local notification only. All exits are appropriately marked, and staff will familiarize themselves with the emergency evacuation procedures. All exits shall be unlocked during working hours. At the sound of a smoke or carbon monoxide alarm or during an emergency situation, staff will evacuate the building and meet in the emergency evacuation area, located north of Building 204 in the parking lot. A head count will be performed by the SSHO or assigned personnel. This head count will be compared to the sign in sheet maintained in the Building 204 main office area.

The onsite personnel will notify Boeing Communications Center via the radio or cell phone as listed above. The SSHO will meet the response team at emergency evacuation area. Fire extinguishers located in Building 204 may be used on incipient-stage fires only if the individual involved has been trained and feels comfortable doing so.

Evacuation drills will be conducted as necessary to inform new staff of evacuation procedures, or if there is an increased risk of wildfires in the area. During the evacuation drill, all notification procedures will be followed and a complete evacuation of the building will occur.

Response Procedures for Wildfires

Wildfire season occurs from July to November, although wildfires can occur during anytime of the year. In the event the site needs to be evacuated due to a wildfire, the SSHO will notify field and office staff via the radios/cell phones to meet at the closest assembly area (attached). A list of assembly areas is available in each field safety kit. Staff should wait for instructions from Boeing via radio or phone. Once the situation has been assessed through contact with Boeing Communications Center, the appropriate evacuation routes will be determined. All personnel will be accounted for via radio or cell by SSHO or the field supervisor. The SSHO or the field supervisor will immediately contact Boeing to report last known location of any personnel not accounted for.

Earthquakes

Earthquakes can trigger landslides, flooding, fires, dam failures, and other disasters several hundred kilometers from the epicenter. Most casualties result from falling objects and debris, or the collapse of buildings not built to "sway" during a quake.

During an Earthquake

DO NOT TO RUSH OUTSIDE, even after the initial shock. The time span between first and second shocks is generally too short (2 to 5 minutes) for evacuation. The safest areas during an earthquake are away from heavy furniture or appliances, windows, heaters, electric supply center, water and gas lines. Seek out spots protected from falling objects, such as under a desk or table, in a doorway, or under main support beams. Stairways are very dangerous during an earthquake and should be avoided. Remain calm and take the following steps:

Inside Building

- Shelter under desk or table or other sturdy furniture with back to windows.
- If not near any furniture, sit in a corner or with back against a wall with back to windows.
- Drop to knees, clasp both hands behind neck, bury face in arms, make body as small as possible, close eyes, and cover ears with forearms.
- If notebooks or jackets are handy, hold over head for added protection.
- Stay away from windows, bookcases, or other heavy objects.
- Maintain position until shaking stops.

Outside Building

- Assume DROP AND COVER position in an open space.
- Maintain position until shaking stops.
- Move away from buildings, trees, overhead wires, and rock formations.
- Do NOT enter building until it is determined to be safe.

After an Earthquake

- Quickly estimate damage and further danger and make decision on the degree of damage.
- Check evacuation routes for obstacles, such as water (electrical hazard), fire, fallen debris, or blocked passages.
- If safe, evacuate staff away from buildings, light posts, electric power lines, etc.
- If possible, save first aid kit to assist injured.

Re-entry Checklist

After an earthquake, buildings should not be re-entered until the following items have been checked:

- Fire or fire hazards.
- Gas leaks: if leak is suspected or identified shut off main gas valve.
- Damaged electrical wiring: if there is any damage, shut off power at control box.
- Downed or damaged utility lines: DO NOT TOUCH downed power lines or

- objects in contact with them.
- Items in closets and cupboards which may tumble off shelves when door is opened.
- Immediately clean up any spilled materials. Follow the spill response procedures detailed above.
- Check and water supply. Never assume water is safe to drink unless it is bottled.

Floods

Floods caused by significant rainfall in localized areas are typically seasonal and occur as flash flood. In the Santa Susana Mountains most heavy rainfall typically occurs between December to April. Be especially alert for floods in mountain areas. Areas such as the deep/ steep canyons of the Northern Buffer Zone are most prone to flash floods. If you suspect a flash flood, IMMEDIATELY GO to higher ground.

Preparing for a Flood

- Know your elevation above flood state.
- Plan an evacuation route.
- If a warning signal is received, move to safe area before access is cut by flood water
- If required to evacuate, inform the SSHO.

During a Flood

- Avoid panic and act quickly; there may be only seconds to respond to a flood event.
- During evacuation, take a first aid kit if possible.
- Get out of areas subject to flooding, such as low spots, canyons, washes, dry stream beds, other low-lying areas.
- Avoid already flooded and high velocity flow areas -- do not attempt to cross flowing streams on foot where water is above the knee.
- If driving, know the depth of the water before crossing areas where water is over the road. If the vehicle stalls while attempting to cross water, get out immediately and seek higher ground; rapidly rising water may engulf the vehicle and sweep it away.
- Use extreme caution at night as it is more difficult to recognize flood danger.

After a Flood

- Search affected areas for injured personnel and provide assistance.
- Use flashlights, not candles or torches, to examine buildings (flammables may be
- inside).
- Do not handle live electrical equipment in wet areas; it should be checked and dried before use.

Thunderstorms and Lightning

Thunderstorms, lightning storms, and high winds may occur on site. If lightning is seen or thunder heard, the "30-30 Rule" will be used where visibility is good and there is nothing obstructing the view of the thunderstorm. The 30-30 Rule means that when lightning is seen, the time until thunder is heard is counted: if that time is 30 seconds or less, then the thunderstorm is within six miles and is dangerous. If this occurs, activities will be suspended d will not resume until at least 30 minutes after the last clap of thunder is heard.

The weather will be monitored routinely. If warranted by weather conditions, certain field operations may be suspended until conditions are safe. The SSHO will determine what operations, if any, are safe to perform based on existing and anticipated conditions. The following are general guidelines to follow during thunderstorms.

- Remain indoors and away from windows during thunderstorms
- If you cannot get indoors, seek shelter in a dry cave, or gully
- An individual can receive a charge from a lightning strike if standing near an object that has been struck. Therefore, if lightening is occurring, tall objects and features that may conduct electricity should be avoided. Examples are: trees, fences, metal pipes, railroad tracks, or other metal objects should be avoided. Do not be - or stand next to - tallest object in the area.
- Do not stand on hilltops or open fields.
- Do not stand in or near water.
- Do not seek shelter in small sheds or barns in open areas.
- If in closed vehicle, roll up windows and remain inside; do not lean against the doors or play the radio.

APPENDIX M

DUST CONTROL MEASURES
REVISION 0, MARCH 2010

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DUST CONTROL MEASURES
REVISION 0, MARCH 2010

Applicable Federal and State Laws, Local Regulations, and Executive Orders

- Ventura County Air Pollution Control District (VCAPCD) Codes and Regulations.

A Ventura County Air Pollution Control District (VCAPCD) permit is not required if compliance is maintained with the following: VCAPCD Rule 50 and South Coast Air Quality Management District rules 403, 403.1, and 1186, fugitive dust control measures will be in place during activities and events (VCAPCD, 2008). These regulations state that a person shall not cause or allow the emissions of fugitive dust from any active operation beyond the property line of the emission source and that best applicable control measures shall be used to minimize fugitive dust emissions.

Dust control measures have been developed to provide the management of fugitive dust producing activities to ensure compliance with the currently emplaced fugitive dust control regulations and policies under Federal and State laws, local regulations, and Executive Orders within the jurisdictional boundaries of Santa Susana Field Laboratory and the Northern Buffer Zone located in Ventura County, California.

Dust Mitigation Protocols

Dust mitigation will be conducted for specific activities that produce temporary fugitive dust and equipment emissions. Associated activities may include, but are not limited to, windblown dust caused by:

- vegetation clearance and mulching
- paved and unpaved road dust, unpaved parking lots and storing areas
- bulk material handling and storage piles
- disturbed land and open areas
- truck hauling

These activities will have in place a prescribed control measures to reduce dust emissions during the events in order to not produce visible dust plumes greater than 50 feet in length beyond the Santa Susana Field Laboratory and Northern Buffer Zone. It is not anticipated that the project will produce a continual or stationary emission source.

Fugitive dust emission reduction and control measures may include, but are not limited to:

- Field crews will be equipped with hand sprayers to conduct localized dust suppression as necessary.
- Fine spraying of water on large active fugitive dust producing areas.

- Covering of stockpiles or containers of removed vegetation with tarps or plastic.
- Oversight personnel will be present at all times during activities that potentially could produce dust, to monitor dust suppression procedures.
- Post cleanup such as sweeping of roads at dust producing activity areas.
- Particulate monitoring during fugitive dust producing activities.
- Speed control on unpaved roads of 15 miles per hour.
- Dust suppression for soil and vegetation hauling. Trucks used for these activities will use a tarp and a minimum of 6 inches of freeboard will be maintained.

Boeing is currently using Best Management Practices at Santa Susana Field Laboratory for stormwater discharge, erosion control, and surface water runoff. During dust suppression activities the U.S. Environmental Protection Agency and its contractors or subcontractors will take precautions to limit discharge of water onto the ground and will not cause runoff.

APPENDIX N

PROTECTION OF RIPARIAN AREAS
REVISION 0, JUNE 2010

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PROTECTION OF RIPARIAN RESOURCES
REVISION 0, JUNE 2010

Field activities associated with USEPA's proposed action at the SSFL site will occur within riparian habitat within Area VI and the Northern Buffer Zone. USEPA is conducting this project pursuant to federal legislative mandate 2764, the Consolidated Appropriations Act of 2008, and the authority granted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

California Department of Fish and Game Code 1602 requires notification to California Department of Fish and Game should any person, business, state or local government agency, or public utility propose an activity that will:

- substantially divert or obstruct the natural flow of any river, stream or lake;
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

With implementation of the avoidance and minimization measures identified by USEPA, the proposed action does not meet these criteria. In addition, the administrative requirements of State and Federal environmental laws are not applicable to on-site activities under CERCLA. Therefore, although a notification is not required for this project, the proposed action will be conducted in a manner that meets the substantive, technical requirements of the California Department of Fish and Game Code 1602. Avoidance and minimization measures will be implemented to avoid impacts to riparian resources in the study area. The avoidance and minimization measures listed below were developed in consultation with the California Department of Fish and Game. These measures will be enforced via the presence of USEPA's biological monitors and on-site USEPA staff oversight of the project. Additional details regarding protected species and associated avoidance and minimization measures can be found in the Biological Opinion prepared by the United States Fish and Wildlife, Appendix G [Natural Resource Protection Measures] of this Site Management Plan and in accordance with the substantive requirements of applicable Federal and State laws, local requirements and regulations and Executive Orders (EOs) applicable for this site described in Table 5.1 of this Site Management Plan.

Applicable Federal and State Laws, Local Regulations and Executive Orders

- California Department of Fish and Game Code 1602

Riparian Habitat Avoidance and Minimization Measures

A qualified biological monitor shall be present during work in all department jurisdictional areas, and shall survey for the presence of any state and federally listed threatened or endangered species or state species of special concern, potentially or locally known in the area. If any life stages of any native vertebrate species are found in the path of construction, the monitor shall make every effort to relocate the species to a safe location. In accordance with Appendix G Protection of Natural Resources Measures and where applicable, exclusionary devices shall be erected to prevent the migration into or the return of species into the work areas.

Between March 1 and September 15, two weeks before initiation of action-related activities, a qualified biologist will survey the area to determine the presence or absence of nesting threatened, endangered, and migratory birds. If breeding activities are observed or an active bird nest is located, a buffer shall be established using stakes and tape to demarcate the setback zone. The area will not be disturbed until the nest becomes inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, and the young will no longer be impacted by the proposed action.

Thinning of riparian vegetation should be limited to the minimum extent necessary and will not involve the removal of trees. Where necessary, riparian vegetation will be trimmed to a height of 6 to 18 inches and will not involve grubbing or disturbance of root systems. Non-native invasive species found within riparian habitats will be removed and disposed of off-site. Vegetation cutting protocols are described in detail in Appendix E.

Vegetation removed from a stream shall not be stockpiled in the streambed or on its bank. Cut vegetation will be stockpiled in upland areas outside the stream channel. The vegetation piles shall not be placed in areas that may impact sensitive floral resources or dormant seeds, or in areas where rodent populations may be deemed a nuisance (such as, adjacent to agriculture lands and residential properties).

Action will be taken to minimize impacts to stream channels and stream channel alteration is not anticipated. However, if a stream channel has been altered during the operations, then action will be taken to return the altered portion of the channel to pre-project conditions, to the extent practicable, without creating a possible future bank erosion problem, or a flat wide channel or sluice like area.

While conducting gamma scanning surveys within riparian habitat, appropriate scanning equipment shall be selected that minimizes the physical effects to the habitat, while achieving maximum sensitivity of the scanner.

If measurable rain is predicted within 24 hours, ground-disturbing activities within riparian habitat shall cease. Surface water sampling activities in riparian habitat is allowed before, during, and after any rainfall event. As deemed necessary by USEPA, protective measures to

prevent siltation or erosion shall be implemented and maintained in accordance with the sampling procedures and protocols identified in USEPA's field sampling plan for groundwater, surface water and sediment testing.

Staging and storage areas for equipment and materials shall be located outside of the riparian habitat.

Any equipment or vehicles driven or operated within or adjacent to the riparian habitat shall be checked and maintained daily, to prevent leaks of materials that, if introduced to water, could be harmful to aquatic life.

Stationary equipment (such as motors, pumps, generators, and welders) located within or adjacent to the riparian habitat shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill or leak.

No equipment maintenance shall be conducted within or near any stream channel or riparian habitat where petroleum products or other pollutants from the equipment may enter the areas under any flow.

Where possible, access to each sampling location within the work site will be via existing roads and access ramps. Off-road access will be limited as much as possible to foot traffic; use of off-road vehicles will be minimized. If no ramps are available in the immediate area, the Applicant may construct a temporary ramp within the footprint of the study area. Temporary ramps shall be removed upon completion of the project and the disturbed area restored to its pre-existing condition.

No debris, soil, silt, sand, bark, slash, sawdust, rubbish, construction waste, cement or concrete or washings thereof, asphalt, paint, oil or other petroleum products or any other substances which could be hazardous to aquatic life, or other organic or earthen material from project-related activities shall be allowed to contaminate the soil or enter into or placed where it may be washed by rainfall or runoff into, waters of the State. Any of these materials, placed within or where they may enter a stream or lake, shall be removed immediately. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream or lake.